No. 2017-1041

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

NICE SYSTEMS LTD., NICE SYSTEMS INC.,

Plaintiffs-Appellants,

v.

CLICKFOX INC.,

Defendant-Appellee.

On Appeal from the United States District Court
for the District of Delaware, No. 1:15-cv-00743-RGA, Judge Richard G. Andrews.

BRIEF FOR PLAINTIFFS-APPELLANTS NICE LTD. AND NICE SYSTEMS INC.

GUY YONAY
DAVID A. LOEWENSTEIN
CLYDE A. SHUMAN
PEARL COHEN ZEDEK LATZER
BARATZ LLP
1500 Broadway, 12th Floor
New York, NY 10036
(646) 878-0800

GREGORY H. LANTIER
RICHARD A. CRUDO
HYUN GYO CHUNG
WILMER CUTLER PICKERING
HALE AND DORR LLP
1875 Pennsylvania Avenue, NW
Washington, DC 20006
(202) 663-6000

S. CALVIN WALDEN
WILMER CUTLER PICKERING
HALE AND DORR LLP
250 Greenwich Street
New York, NY 10007
(212) 937-7215

January 12, 2017

Attorneys for Plaintiffs-Appellants

CERTIFICATE OF INTEREST

Counsel for Plaintiffs-Appellants NICE Ltd. and NICE Systems Inc. certifies the following:

1. The full name of every party or *amicus* represented by us is:

NICE Ltd. and NICE Systems Inc.[1]

2. The names of the real party in interest represented by us is:

Not applicable.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

NICE Ltd. owns 10% or more of NICE Systems Inc. There are no companies which own 10% or more of NICE Ltd.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are (and who have not or will not enter an appearance in this case) are:

MORRIS, NICHOLS, ARSHT & TUNNELL LLP: Jack B. Blumenfeld.

Dated: January 12, 2017

/s/ *Gregory H. Lantier*

GREGORY H. LANTIER
WILMER CUTLER PICKERING
HALE AND DORR LLP
1875 Pennsylvania Avenue, NW
Washington, DC 20006
(202) 663-6000

[1] After the district court action was filed, NICE Systems Ltd. changed its name to NICE Ltd.

TABLE OF CONTENTS

TABLE OF AUTHORITIES

CASES

STATUTES, REGULATIONS, AND CONSTITUTIONAL PROVISIONS

PATENTS AND PATENT APPLICATIONS

OTHER AUTHORITIES

STATEMENT OF RELATED CASES

There is no other appeal in or from the same civil action or proceeding in the lower court that was previously before this or any other appellate court. Additionally, there are no other proceedings known to counsel for Appellants NICE Ltd.[2] and NICE Systems Inc. (collectively, "NICE") that would directly affect or be directly affected by this Court's decision in this appeal.

JURISDICTIONAL STATEMENT

The district court had jurisdiction over this patent infringement action pursuant to 28 U.S.C. §§ 1331 and 1338(a). The district court issued an order dismissing the action on September 15, 2016, and NICE timely appealed. *See* Appx20; Appx602. This Court has jurisdiction over the appeal pursuant to 28 U.S.C. § 1295(a)(1).

INTRODUCTION

Titled "System and Method for Tracking Web Interactions with Real Time Analytics," U.S. Patent No. 8,976,955 ("'955 patent") claims an improvement over preexisting methods and systems "for monitoring a user's interactions with Internet-based programs or documents." Appx21(Abstract); Appx108(61:32-33 (claim 1 preamble)). As described at length in the patent's written description, the claimed invention is a better method and system for real-time tracking and analysis

[2] After the district court action was filed, NICE Systems Ltd. changed its name to NICE Ltd.

of a user's Internet activities, and identifies an optimal path of webpages for a user to visit during a future Internet session based on a modeled session built from web-usage data aggregated from many users. Appx78(1:47-57); Appx108(61:32-50). The patent issued in 2015 from an application originally filed in 2011 (more than fifteen years after widespread adoption of e-commerce), and was examined in the immediate aftermath of the Supreme Court's decisions in *Bilski*, *Mayo*, and *Alice*. The examiner allowed the '955 patent claims in express consideration of multiple prior art references that described preexisting technology for monitoring a user's interactions with the Internet.

The independent claims of the '955 patent focus overwhelmingly on a specific combination of steps that collectively effect an improvement in tracking and analyzing users' Internet interactions, which remains a difficult technological feat for companies that welcome millions of users to their websites. *See* Appx92(30:53-55). Indeed, as the claim limitations indicate, the technological improvements of the invention are precisely what distinguished it from the prior art of record during patent prosecution, and they are the subject matter to which all the claims are directed. The claim limitations also demonstrate technologically novel and unconventional techniques that—both individually and as an ordered combination—constitute an inventive concept. Thus, the '955 patent is similar to the patents that this Court has found not to claim ineligible subject matter in

BASCOM Global Internet Services, Inc. v. AT&T Mobility LLC, 827 F.3d 1341 (Fed. Cir. 2016), and *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288 (Fed. Cir. 2016).

The district court, however, ignored the claims' preambles and limitations to determine that the '955 patent is directed to an abstract idea at *Alice* Step One. Specifically, the court concluded that the claims of the '955 patent are directed to "cross-channel customer service." Appx7; Appx11. That was error. Cross-channel customer service is featured ***only*** in the final claim element of the independent claims. And, there, cross-channel customer service is mere post-solution activity, not the main focus of the claimed invention.

The district court compounded its error at *Alice* Step Two, where it ignored most of the claim limitations entirely and wholly failed to consider whether the ordered combination of the claim limitations reflects an inventive concept. *See* Appx11-19. Without substantial analysis, the district court then made a sweeping and facially unsupportable finding that the '955 patent does nothing more than "claim the abstract idea of engaging customers across multiple communications channels by simply limiting one of the claimed channels to being the Internet." Appx15.

The district court's analysis cannot be squared with the '955 patent's claims, written description, or prosecution history (the relevant portions of which were

before the district court but left entirely unaddressed). The '955 patent does not claim patent-ineligible subject matter, but instead claims a specific improved technology for monitoring a user's Internet interactions. For these reasons, the district court's dismissal of NICE's complaint runs contrary to the Supreme Court's and this Court's decisions regarding 35 U.S.C. § 101, and should be reversed.

STATEMENT OF THE ISSUES

1. Whether the district court erred in finding that each claim of the '955 patent is directed to the abstract idea of "cross-channel customer service," where the claims and patent are expressly directed to specific improvements over preexisting methods and systems for tracking and analyzing a user's Internet interactions; and

2. Whether the district court erred in finding that the '955 patent claims do not provide an inventive concept, where the components and processes recited in the claims are individually innovative over preexisting systems, and, at a minimum, are combined in such a way that gives rise to a technologically unconventional invention.

STATEMENT OF THE CASE AND FACTS

I. THE CHALLENGES OF MONITORING A USER'S INTERACTIONS WITH THE INTERNET

For as long as companies have hosted websites, they have sought to monitor those websites' users' interactions with the Internet and to make use of that information.[3] Since at least the late 1990s, technologies have been employed in furtherance of that task, and various improvements to such technologies have resulted in patents held by a number of important innovators in computer and Internet technology, such as IBM and Yahoo!.[4] *See* Appx21(References Cited); Appx427.

But monitoring a user's interactions with the Internet raises numerous technological challenges with which information systems engineers have struggled. First, for example, the amount of data concerning a user's interactions with

---

[3] *See, e.g.*, U.S. Patent No. 7,035,926, "Real-Time Monitoring of Web Activities," at 2:14-21 (IBM patent filed in 1999 and cited by the examiner during prosecution of the '955 patent) ("There is similarly a need for operators of network servers, such as a Web server that supports a Web site, to be able to know at any given time the numbers and identities of users accessing different server resources, such as Web pages on the site. This knowledge can assist the operator, in real time, in supporting and interacting with users of the server resources and, more generally, in understanding and responding to users' needs."); *see also* Appx21; Appx427.

[4] *See, e.g.*, U.S. Patent No. 7,958,234, "System and Method for Monitoring User Interaction with Web Pages" (Yahoo! patent claiming priority to an application filed in 1999 and cited by the examiner during prosecution of the '955 patent); *see also* Appx21; Appx427.

Internet programs and documents is massive. The Internet is a vast forum in which millions of users traverse a company's webpages in seemingly unpredictable patterns. Each one of those user's web-browsing activities creates copious amounts of data. *See* Appx79(4:5-18) (noting that data is created "each time a user or customer interacts with the web or Internet" by, among other things, "selecting a search term, 'browsing' or accessing a webpage, viewing a product description via the Internet, etc."). The unprecedented volume of information generated by Internet interactions is an obstacle to real-time monitoring of any individual user's interactions, let alone interactions for millions of users.

Second, Internet server traffic is disparate, and it is difficult for a computer to differentiate relevant or useful Internet interaction data from other data. For instance, much of the information generated from a user's interactions with a website has no commercial significance. Yet, data are generated for all user interactions, and not just for those that may be germane to understanding the relevant interests of the user. Thus, the ability to track important customer-specific information while discounting irrelevant information is limited, especially in the absence of social cues attendant with in-person interactions between customers and sales agents. *See* Appx88(22:44-48) (noting that "interactions between [a] customer and the organizational web servers are different in nature than human-human interactions").

Third, even when relevant Internet interaction data is directly observed, the user's Internet interactions are frequently ambiguous. Although technology has long existed for allowing a human sales agent to directly monitor a user's web-browsing behavior, the data arising from such behavior remains equivocal without an added functionality that interprets and discerns the relevant information. If an agent does not ask the customer directly, the agent may be unable to reasonably determine, for example, whether a user who spends fifteen minutes browsing a product page of a website is genuinely interested in purchasing that product, is looking for a related product, is seeking to obtain product ideas generally, or has stepped away from his or her computer and forgotten to log off. Thus, there is an inherent ambiguity associated with web-usage data that does not exist outside the confines of the Internet and that adds a layer of complexity to monitoring Internet interactions in any meaningful way.

II. PRIOR ART METHODS FOR MONITORING AND INTERPRETING A USER'S INTERACTIONS WITH THE INTERNET

As noted above, by the mid- to late-1990s, many companies were using the Internet to sell their products and services, and many were also seeking to engage in cross-channel customer service to facilitate sales that could result from online browsing. But the ability to monitor a user's interactions with the Internet and make meaningful use of the resulting information was constrained by technological hurdles. At the time of the '955 patent's filing, for instance, the existing methods

for monitoring a user's interactions with the Internet sought primarily to mirror human-to-human interactions that dominated the pre-Internet age. Indeed, these early methods involved some variation of sales agents directly monitoring a specific user's Internet use, and then, based on the agent's observations and judgment, initiating communication with that user.

The system of U.S. Patent Application Publication No. 2002/0083167 to Costigan et al. ("Costigan"), which claims priority to an application filed in 1998, is one example of such a prior art method. Discussed at length during prosecution of the '955 patent, Costigan describes a system in which a web user registers with an online service that "returns a frame set to the visitor's browser." Costigan at p. 5; Appx421-428; Appx509-518. A "frame set" is a separate pop-up window that appears in the user's Internet browser to allow for two-way communication between the user and a sales agent. Costigan at p. 5; *id.* ¶ 10; Appx458; Appx513; Appx516-517. The frame set, which "stay[s] with the visitor during their visit," also allows the sales agent to manually "track and identify the visitor" as the visitor traverses the company website. Costigan at p. 5; Appx460; Appx514-516; Appx525. In particular, the Costigan system allows the agent to manually "watch" the user "move through" the website as data is captured for purposes of monitoring the user's interactions with that website. Costigan ¶ 21.

The system in Costigan, however, lacks the ability to extract specific data from or interpret the content of the webpages that the user is viewing. Instead, the sales agent knows to begin monitoring a user's interactions with the company website if the user lingers on a particular webpage for some set period of time (e.g., three minutes). *Id.*; Appx459; Appx514-516. When that occurs, the sales agent can be notified and thereafter initiate a web-based interaction with the user. Costigan ¶ 21; *see also id.* at Abstract. In essence, the Costigan system assumes that a user's presence at a particular webpage, alone, "is a statement of interest in the subject goods or services" offered on that webpage, but the system is unable to analyze or derive value from the user's interactions with other webpages. *Id.* ¶ 9. And while the Costigan system can be used for a sales agent to make a product recommendation, *see id.* ¶ 21, that recommendation is simply whatever message the sales agent chooses to convey based on his or her observation and judgment.

Similarly, the prior art system described in U.S. Patent Application Publication No. 2007/0208682 to Mancisidor et al. ("Mancisidor"), also discussed during prosecution of the '955 patent, features an "expert" computer system that generates product and service recommendations (stored in a database) for a sales agent to offer to a customer, as shown in the figure below. Mancisidor ¶ 11; Appx430-439; Appx520-527.

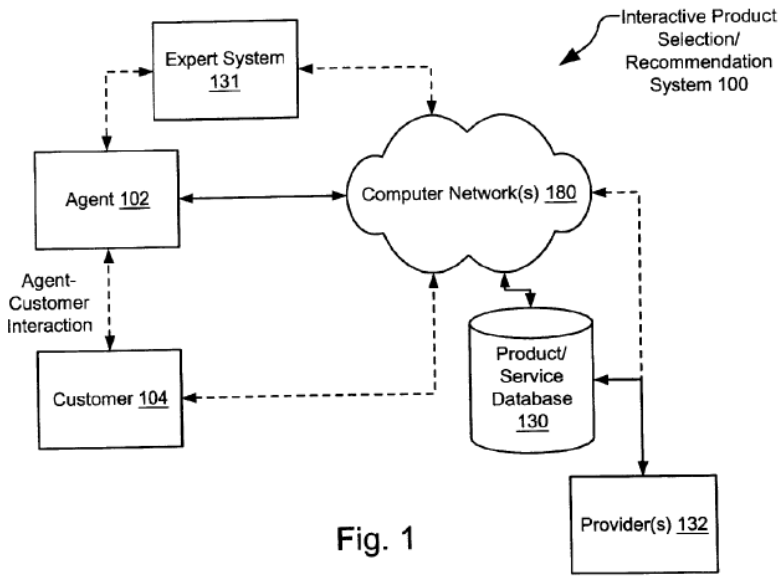


Fig. 1

Mancisidor at Fig. 1. Those recommendations, however, are not based on the web-browsing activity of the customer, but instead on the "customer's answers" to "a set of questions relating to the needs of the customer," which are manually inputted into the system. *Id.* ¶¶ 16, 34; Appx525. In other words, in the Mancisidor system, the Internet merely facilitates access to existing information by allowing the expert system to retrieve product and service recommendations from the database. *See* Mancisidor ¶¶ 61-62; Appx526. The Internet is not used to collect the data or to make those recommendations.

Finally, since at least 2000, there was commercially available software—for example, NCR Corporation's InterRelate+ customer relationship management software and Relationship Optimizer marketing automation solution—that could assist call center agents by providing recommendations for cross-channel customer service based on a customer's past Internet usage. Such software is described in,

among other places, U.S. Patent Application Publication No. 2002/0087385 to Vincent ("Vincent"). *See* Vincent ¶ 23. Like Costigan and Mancisidor, Vincent was discussed at length during examination of the '955 patent. *See* Appx441-461.

Vincent describes a system and method "for suggesting interaction strategies to customer service representatives in a customer relationship management environment which includes analyzing customer data to determine one or more patterns and generating a set of rules based upon the patterns." Vincent at Abstract. In Vincent, a specific customer's purchases and behaviors across a variety of different channels are captured and stored. *Id.* ¶ 24. These channels could include "advertisements, virtual interactions such as the businesses' web site(s), or e-mail, call centers, in-store visits, and direct mailings." *Id.* Once stored, that customer's data is analyzed by a computer to identify the customer's "usual behavior" on the website—i.e., the "previously observed behavior patterns for the current customer contact." *Id.* ¶¶ 23, 32; Appx457-458. Based on those patterns, the software generates recommendations for the user to retry certain of those paths. *See* Vincent ¶¶ 23, 32; Appx457-458; *see also* Vincent ¶¶ 9, 16-18. For example, if "Customer A has a pattern of resolving customer service issues through the business's Internet website," then when Customer A phones the call center, the Vincent system could "recommend a strategy to the call center representative of reminding Customer A to use the Internet site as a convenience."

Id. ¶ 32; Appx457-458. In other words, in the system described in Vincent, a call center agent makes a recommendation to a specific customer, based on that customer's past Internet usage history, to repeat the same web-browsing activity in which the customer engaged in the past. *See* Appx457-458.

In order to accomplish these tasks, Vincent describes a system consisting of three main sets of components, as shown in the figure below.

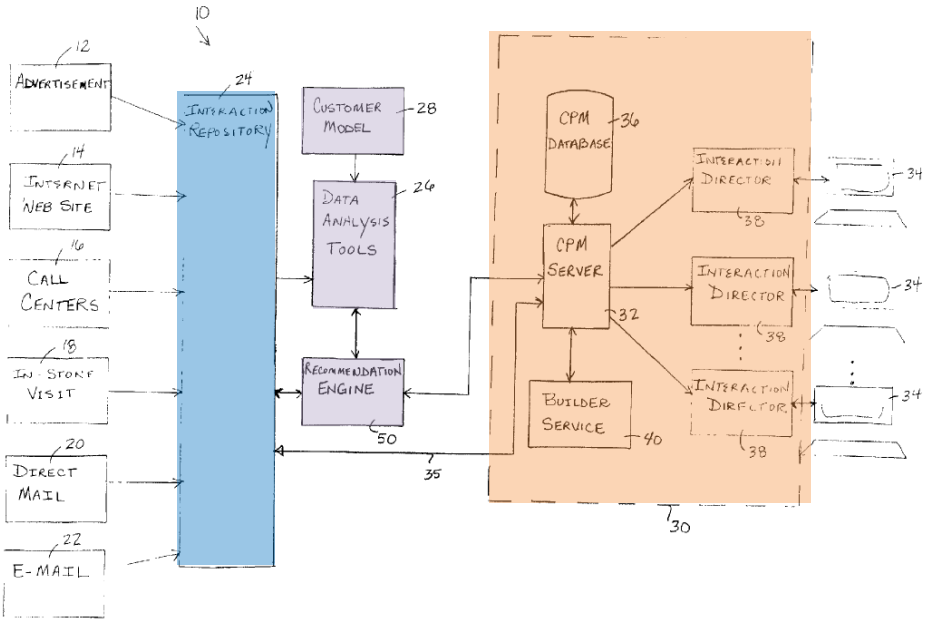


FIGURE 1

Vincent at Fig. 1. First, Vincent describes an "interaction repository" 24 (annotated in blue), which stores all of the data from one or more customer data sources. *Id.* ¶ 24.

Second, "data analysis tools" 26 (annotated in violet) are used to analyze the stored data regarding that customer. *Id.* ¶ 25. These tools can incorporate the use of a "customer model" 28 (also annotated in violet). *Id.* The customer model,

however, is "derived by a business or marketing analyst," and is not modeled from actual Internet interaction sessions of other users. *Id*. The model is then used in the data analysis tools to output "product affinities . . . and customer product ownership profiles—i.e. the set of products already owned by each individual customer plus the set of products that are likely [based on the marketing analyst's model] to be complementary or needed based upon the customer's habits or attributes." *Id.* Thereafter, a "recommendation engine" 50 (also annotated in violet) "generates a set of 'rules' based upon [that user's] patterns determined by the data analysis." *Id.* ¶ 31. "When a particular interaction or customer request follows one of the rules, a stratgy [sic] is suggested which corresponds to the rule." *Id.* Specifically, the recommendation engine "suggest[s] interaction strategies . . . based upon the previously detected customer patterns and purchase history." *Id.*

Third, Vincent describes a "customer personalization management application" 30 (collectively annotated in orange), which serves to store and route the personalized information from the recommendation engine to call center agents. *Id.* ¶ 27.

III. THE '955 PATENT

Unlike these preexisting systems, the '955 patent describes a method and system for monitoring a user's interactions with the Internet by (1) extracting only select content from captured Internet server traffic; (2) defining individual

"Internet interaction sessions" that may differ from the user's actual Internet browsing sessions, and associating the extracted information with at least one of those Internet interaction sessions; (3) storing and indexing each of those Internet interaction sessions; and (4) comparing one or more of the user's Internet interaction sessions to "modeled sessions" to provide a recommendation for an optimal future Internet interaction session for that individual. The output or result of performing the inventive method of the '955 patent can then be forwarded to a call center agent for use in assisting customers. The technological advantages of the method described in the '955 patent enable the call center agent to recommend, in real time, a future Internet session path.

A. The Written Description

The patent's sixty-four column specification describes in detail the structure, operation, and arrangement of various components of the claimed invention. An embodiment of that invention is depicted in annotated Figure 4, below.

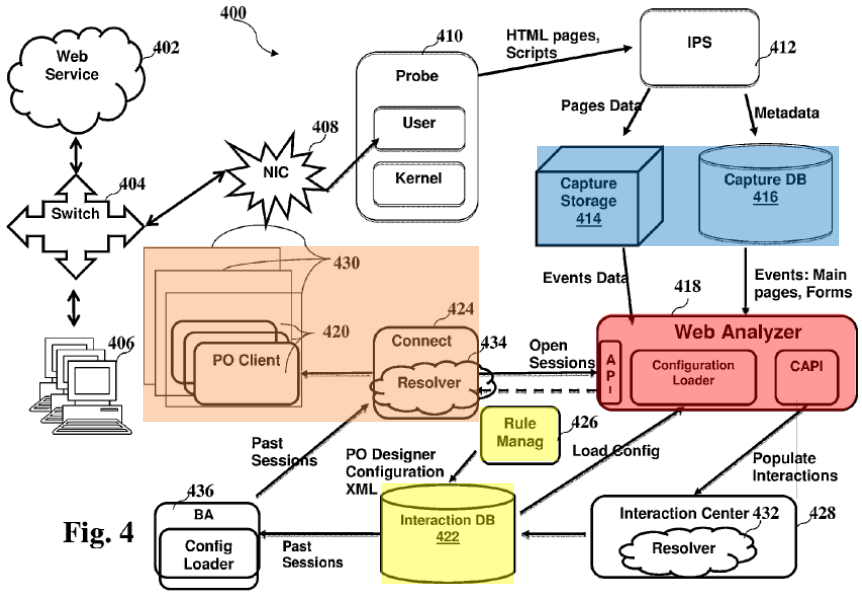


Fig. 4

Appx26(Fig. 4); *see generally* Appx82(10:19-67); Appx83(11:1-12:53).

In a typical scenario, a user 406 browses the Internet and interacts with various websites through a web server 402, which "provid[es] web content or documents (e.g., interactions with programs, documents, or users accessed via the Internet)" to the user. Appx82(10:26-31). Monitoring the web server is a "web capture server" 410, which includes one or more "passive sniffing devices, probes or other capturing modules" that capture, in real time, user traffic "across the Internet" that is generated "each time a user or customer interacts with the . . . Internet." Appx79(4:5-9, 4:20-22, 4:57-60); Appx80(5:25-29, 5:46-53, 6:44-47); Appx82(10:31-40, 10:60-67 (noting that sniffing devices are "adapted to capture, intercept and/or log traffic passing over" the Internet)); Appx89(24:36-42); Appx93(32:60-61). The Internet server traffic data is then stored in a "capture

database" 416 or "capture storage" device 414 (collectively annotated in blue). Appx82(10:46-51).

In the first step of the invention claimed in the '955 patent, an "analysis server" or "web analyzer" 418 (annotated in red) extracts content—e.g., "metadata, embedded tags, URLs or other information"—from the stored data. Appx81(7:9-17); Appx82(10:52-57). The system extracts only select data from each web interaction according to predefined parameters, features, or rules, such as "the presence or frequency of certain keywords." Appx79(4:9-17); Appx80(6:54-67); Appx81(7:1-3). These extraction rules can be "adapted on a session-by-session basis." Appx79(4:17-20). During this step, the web analyzer can "analyze the data, identify, filter, save or extract interesting elements," as well as "automatically and passively determine the user identity of web interactions, for example, by passively sniffing metadata (e.g., cookies) or the web pages themselves." Appx81(7:12-34); Appx82(10:52-60).

Second, the web analyzer associates the extracted content with one or more "Internet interaction sessions." Appx81(7:12-17); Appx82(10:57-60); Appx108(61:36-37). An Internet interaction session in the '955 patent may be different from an Internet browsing session, which comprises the list of websites that a user has previously visited. For example, an Internet interaction session could be defined to end based upon many different triggers, including the moment

a customer completes a transaction or after a customer remains inactive for some period of time. Appx79(4:29-35).

Third, the Internet interaction sessions are stored and indexed in an "interactions database" 422 (annotated in yellow) for later use. Appx81(7:15-17); Appx83(11:18-23); Appx89(24:53-59). This allows the system to retrieve and use the most relevant Internet interaction sessions associated with a particular user or users when needed. In one embodiment of the invention, for example, a rule manager may index the data by inserting storage rules into the database. Appx94(34:22-27). Such indexing would, in turn, allow the relevant session information to be retrieved through a search for a relevant storage rule. *Id.* (34:41-44).

Fourth, the web analyzer analyzes data from the interactions database and automatically compares a user's Internet interactions to one or more "modeled sessions" to generate a recommendation of a future session path. Appx80(5:9-24); Appx108(61:40-42, 62:32-36); Appx109(64:19-22). A modeled session represents "ideal session histories" aggregated from "real-life session summaries generated by other satisfied customers." Appx80(5:9-17); Appx109(63:6-8 (noting that modeled sessions can be "real-life sessions generated by interactions of one or more other users")). It may be "fixed, e.g., including a linear path of webpages to browse, or dynamic, e.g., including tree-structured or matrix paths, where each chosen

webpage path leads to different options, and thus different outcomes." Appx80(5:20-24). Through this nonconventional comparison technique,[5] the optimal model session is "retrieved from a pool of session histories that most closely matches the topics, key-wor[d]s and/or other features used in the current customer's session." *Id.* (5:17-20). An appropriate modeled session retrieved for a particular customer is then used "to predict optimal future session paths to recommend to the customer."[6] *Id.* (5:9-13).

Finally, the generated recommendation is provided in real time to a sales agent device 430 (annotated in orange) in a human-readable format while he or she is speaking to the user via another communication channel, such as a telephone. Appx82(10:4-11); Appx83(11:62-12:45); Appx91(28:34-35 (noting that the recommendation can be provided to the user in real time "based on the user's past or current web interactions")). Although the patent states that the recommendation can be used for purposes of "cross-selling," the written description also explains that the invention can be used for providing "technical support," "filling in

---

[5] During prosecution, the independent claims of the '955 patent were amended to clarify that they ***only*** encompass methods and systems that "compare" the extracted user information "to one or more modeled sessions," disclaiming broader coverage over systems that merely "analyz[e]" a user's Internet interactions in conventional ways. Appx453.

[6] While the written description of the '955 patent describes the modeled sessions in detail, the manner in which the modeled sessions are generated is not the focus of the '955 patent claims.

surveys," or for "other applications." Appx80(6:14-17); Appx81(7:46-48); Appx108(62:20-22).

B. The Claims

The technology described above is recited in the patent's twenty-nine claims. Representative claim 1, for example, recites a "method for monitoring a user's interactions with Internet-based programs or documents." Appx108(61:32-33). The first four limitations describe the technological manner in which data is extracted, associated with a particular user, stored and indexed, and automatically compared to preexisting modeled sessions to generate a recommendation for future Internet session paths, as described in detail above. The last limitation describes one aspect of the invention in which the recommendation is provided to a sales agent while the agent is communicating with the user during a user-initiated telephone call. In full, claim 1 recites:

> A method for monitoring a user's interactions with Internet-based programs or documents, the method comprising:
>
> extracting content from Internet server traffic according to predefined rules;
>
> associating the extracted content with one or more of a user's Internet interaction sessions;
>
> storing and indexing the user's Internet interaction sessions;
>
> automatically comparing, by a web analyzer using a processor, one or more of the user's Internet interaction sessions to one or more modeled sessions to generate a recommendation of one or more

> future session paths from the modeled sessions for guiding the user's Internet interactions; and
>
> providing the recommendation of the future session paths from the modeled sessions on screen to a contact center agent while the contact center agent is communicating with said user during a telephone call initiated by the user between the agent and the user.

Appx108(61:32-50).[7]

The dependent claims add specificity regarding, for example: (1) how to identify a user; (2) the particular content to be extracted and/or analyzed, including keywords that the user used for searching; (3) the content to be included in a summary provided to the sales agent while the call is ongoing; (4) the ability to provide the agent with a playback of the user's past or current Internet interaction sessions; (5) the type of capture devices used; (6) the type of communication channels used; (7) the type of recommendation provided to the user; (8) the real-time provision of a recommendation to a user; and (9) the manner in which the computerized modeled sessions are generated. *See generally* Appx108-109.

C. The Prosecution History

The '955 patent was filed in November 2011, *see* Appx21, more than a year after the Supreme Court's decision addressing patent eligibility under 35 U.S.C.

[7] Independent claim 12 recites a system for performing the method recited in claim 1. *See* Appx108(62:25-43); *see also* Appx5-6.

§ 101 in *Bilski v. Kappos*, 561 U.S. 593 (2010), and more then fifteen years after widespread adoption of e-commerce.[8]

Throughout prosecution, the patent examiner was well aware that technology for tracking and analyzing a user's interactions with the Internet, including for cross-channel customer service, was already known. Indeed, the examiner issued rejections based on Costigan, Mancisidor, and Vincent, and also cited the IBM and Yahoo! patents identified above. *See* Appx21(References Cited); Appx421-428; Appx430-439; Appx441-450; *supra* notes 3-4. The applicants responded to those rejections both by amending the claims and by explaining how the technical features of the claimed invention differed from the prior art. In particular, the applicants noted that the prior art failed to satisfactorily overcome the technological challenges inherent in tracking and analyzing interactions with the Internet.

The applicants explained, for instance, that the prior art methods were limited to "reviewing" or "track[ing]" the users' visiting histories or other "raw, unfiltered records of Internet server traffic," and did not "extract[]" selected

---

[8] *See, e.g.*, *The History of Ecommerce: How Did It All Begin?*, MIVA, http://www.miva.com/blog/the-history-of-ecommerce-how-did-it-all-begin/ (last visited Jan. 11, 2017) (discussing the widespread adoption of online commerce in the mid-1990s); *SSL: Your Key to E-Commerce Security*, webopedia, http://www.webopedia.com/DidYouKnow/Internet/ssl.asp (last visited Jan. 11, 2017) (noting that the Secure Sockets Layer protocol, developed by Netscape in 1994, helped provide security for mainstream e-commerce transactions).

content from such data that could be harnessed for any specific purpose. Appx514-515. The applicants also explained that, unlike prior art methods that enable agents to "watch the visitors move through the site" and "manually analyz[e]" the data collected, the '955 patent invention analyzes the Internet interaction session data "automatically" through a "web analyzer," and thus involved a qualitatively different process. Appx514 (emphases omitted); Appx525. Additionally, the applicants pointed out that the prior art did not enable identification of a new website that was not previously visited by the user, thereby limiting the universe of recommendations to those websites that the user had "already tried." Appx458. Indeed, whereas the prior art produced recommendations "from the user's own interaction history," the invention suggests recommendations by comparing the user's Internet interaction sessions to "modeled sessions" based on "real-life session summaries generated by other satisfied customers." Appx453; Appx458; *see also* Appx80(5:13-20). The applicants argued that this unconventional approach was nowhere found in the prior art of record. *See* Appx457-458.

The Patent Office issued the '955 patent in March 2015, *see* Appx21—three years after the Supreme Court's decision in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289 (2012), and nearly one year after *Alice Corp. Pty. Ltd. v. CLS Bank International*, 134 S. Ct. 2347 (2014). *See also*

2014 Interim Guidance on Patent Subject Matter Eligibility, 79 Fed. Reg. 74,618 (Dec. 16, 2014) (U.S. Patent and Trademark Office's post-*Alice* guidance). By the time of the grant, this Court had also issued several § 101 decisions involving Internet-related patent claims, including *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014), and *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709 (Fed. Cir. 2014).

IV. DISTRICT COURT PROCEEDINGS

Established in 1986,[9] NICE is a worldwide leader of Internet-based solutions that capture, extract, and analyze user information from web sessions, including for purposes of delivering customer-specific insights to businesses in real time. *See* Appx290. Touted as the "industry's first to combine interaction and transaction analysis,"[10] NICE's technology extracts user information from multiple sources, including telephones, emails, social media, and chat rooms, and, using that information, predicts the intent of specific customers, which in turn allows businesses to be proactive in satisfying customer demands. *Id.* NICE sells

[9] *See A Brief Introduction to NICE*, NICE, http://www.nice.com/about-nice/company-overview (last visited Jan. 11, 2017).

[10] Berry Levine, *NICE Systems Launches Customer Engagement Analytics Platform*, CMSWire, http://www.cmswire.com/cms/customer-experience/nice-systems-launches-customer-engagement-analytics-platform-020640.php (last visited Jan. 11, 2017).

platforms that incorporate its patented methods and systems, including its "Engage" product for "Real-Time Web Engagement Analytics." *See* Appx291.

On August 27, 2015, NICE filed an infringement action against its competitor, Appellee ClickFox, Inc. ("ClickFox"), asserting the '955 patent against ClickFox's "Experience Analytics" platform. Appx115; Appx288 (amended complaint). The accused product captures Internet server traffic and performs path analyses of customer interactions across multiple channels, including retail stores, websites, call centers, and chat rooms. Appx291-293.

In response to NICE's infringement complaint, ClickFox filed a motion to dismiss under Federal Rule of Civil Procedure 12(b)(6), arguing that the '955 patent is invalid as claiming unpatentable subject matter under 35 U.S.C. § 101. *See* Appx390.[11] On September 15, 2016, the district court granted ClickFox's motion, invalidating all twenty-nine claims of the '955 patent without claim construction and before discovery. *See* Appx1-20.

A. The District Court Determines that the '955 Patent Claims Are Directed to the Abstract Idea of "Cross-Channel Customer Service"

Consistent with the title of the '955 patent, "System and Method for Tracking Web Interactions with Real Time Analytics," the preamble of each claim

[11] ClickFox's motion was a renewed motion to dismiss—ClickFox withdrew its original motion after NICE amended its complaint. *See* Appx387. ClickFox also filed a motion to dismiss NICE's induced infringement claims as allegedly insufficiently pled, but that motion was denied as moot. *See* Appx2; Appx19-20.

indicates that the claims are directed to methods and systems "for monitoring a user's interaction with Internet-based programs or documents." *See, e.g.*, Appx108(61:32-33). At Step One of the *Alice* analysis, however, the district court found that the '955 patent claims are directed to the abstract idea of "cross-channel customer service, i.e., gathering customer information from one communication channel and using it to engage the customer via another communication channel." Appx7 (footnote omitted); *see also* Appx11. The district court reached that conclusion by stripping the claims of their—in the district court's words—"generic computer components and limitations to particular technological environment." Appx9. In particular, without specifically addressing all of the claim language, the district court characterized nearly all of the claim elements as reflecting only basic computer functions and proceeded to describe those functions in terms that have been deemed abstract in prior cases. Appx7-9. For instance, the district court described the claims of the '955 patent as nothing more than "collecting information, analyzing it, and displaying certain results," "customizing web page content based on information known about the user," and "automat[ing]" a traditional business practice." Appx8 (citations omitted).

Having generalized away nearly all of the limitations of the independent claims, the district court then analogized the invention to a filing system implemented by car salesmen at a dealership. *See* Appx9. In the district court's

analogy, a customer walks into a dealership and tells Salesman A what she is looking for. When the customer leaves without making any purchase, Salesman A remembers that past customers with similar characteristics liked a particular model and notes this recommendation in a file, along with his other observations of the customer. Later when the customer calls the dealership, Salesman B answers and proceeds to recommend that model upon consulting the customer-specific file. *Id.*

The court found that the filing system and the salesman with a very good memory in this example practice the claims of the '955 patent. *Id.* The only difference between this analogy and the '955 patent, according to the district court, is the patent's "automation via generic computer components," which the court understood as "increas[ing] efficiency." *Id.*

B. The District Court Determines that the Claims Do Not Recite an Inventive Concept

At Step Two of the *Alice* analysis, the district court determined that the patent claims do not provide an inventive concept. *See* Appx12. First, while acknowledging that the proliferation of the Internet and mobile technologies added new challenges in customer service, the court nevertheless determined that these new technological environments do "not render the problem addressed by the '955 patent an 'Internet-specific' problem or one 'rooted in computer technology.'" Appx15. The court also found that the claims "would essentially preempt an entire integrated customer service strategy, whenever a user uses any Internet-based

platform and subsequently initiates contact with anything that could be described as [a] contact center." Appx16.

Without discussing most of the claim limitations at all, the district court made the broad finding that the independent claims of the '955 patent (claims 1, 12, and 29) do not add any inventive concept to the abstract idea of cross-channel customer service. Appx12. For the one claim limitation that the district court did discuss (the "automatically comparing . . ." limitation), the court concluded that a "web analyzer" automatically comparing one or more of the user's Internet interaction sessions to one or more modeled sessions "simply describes using a generic processor to speed up an analytical process." Appx13. The court further concluded that the "modeled sessions" recited in that limitation "represent no more than making a basic statistical inference, or prediction of future behavior based on available data." Appx17-18.

The district court's opinion does not suggest that it analyzed the claim limitations as an ordered combination, nor does it directly address whether the components recited in the claims are arranged, used, or interact in an unconventional manner.[12]

[12] The district court's memorandum opinion also does not cite to *BASCOM Glob. Internet Services, Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016), in which this Court upheld patent claims containing generic components arranged and interacting in an unconventional manner. *BASCOM* issued several months before the district court's opinion.

SUMMARY OF THE ARGUMENT

The district court's finding that all twenty-nine claims of the '955 patent are invalid under 35 U.S.C. § 101 is incorrect, and the court's judgment should be reversed. The '955 patent claims are directed to an improvement to technology for overcoming the challenges uniquely associated with tracking and analyzing users' Internet interactions. The claim language, written description, and prosecution history all confirm that this is the subject matter to which the claims are directed.

Yet, at *Alice* Step One, the district court ignored the claims' preambles and discounted all claim elements except the final one in determining that the '955 patent is directed to nothing more than the abstract idea of "cross-channel customer service." The court purported to strip away generic computer limitations, but in doing so, impermissibly removed the invention from its technological context and equated it to a car salesman who recommends a particular car model based on his recollection of a limited number of face-to-face interactions with other customers.

Even if the '955 patent claims were directed to an abstract idea (they are not), they still would not recite patent-ineligible subject matter because, at *Alice* Step Two, the '955 patent claims provide inventive concepts. The methods and systems claimed in the '955 patent require components and processes that are not presented in the '955 patent's written description as generic computing elements operating in conventional ways. At the very least, the ordered combination of

these claim elements reflects an inventive concept, much like the claims upheld in this Court's recent *Amdocs* decision, which were directed to similarly unconventional configurations of computer components for harnessing massive and disparate network-usage data in real time.

In its *Alice* Step Two analysis, the district court accounted for just two terms within a single limitation of claim 1, rather than evaluating each and every claim limitation as required. The district court's error is further evident in its failure to evaluate the claim elements as an "ordered combination," as required by *Alice*. Had the district court properly applied *Alice*, it would have determined that the claims—much like the claims in *Amdocs*—recite specific improvements in computer technology that go far beyond well-understood, routine, and conventional activities.

ARGUMENT

I. STANDARD OF REVIEW

This Court reviews a district court's dismissal for failure to state a claim under the law of the regional circuit, here, the Third Circuit. *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1347 (Fed. Cir. 2016). In the Third Circuit, a district court's grant of a motion to dismiss is reviewed *de novo*. *Buck v. Hampton Twp. Sch. Dist.*, 452 F.3d 256, 260 (3d Cir. 2006). On review, the Court must "accept all factual allegations in the complaint as true and

view them in the light most favorable to" NICE. *Id.* Additionally, this Court reviews a district court's patent-eligibility determination under 35 U.S.C. § 101 *de novo*. *BASCOM*, 827 F.3d at 1347.

II. THE '955 PATENT CLAIMS RECITE PATENT-ELIGIBLE SUBJECT MATTER

Section 101 of the Patent Act provides that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. As this Court has observed, "the subject matter described in § 101 is expansive," *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1293 (Fed. Cir. 2016), and for good reason: the text of § 101 is "cast in broad terms to fulfill the constitutional and statutory goal of promoting 'the Progress of Science and the useful Arts,'" *Diamond v. Chakrabarty*, 447 U.S. 303, 315 (1980) (quoting U.S. Const. art. I, § 8, cl. 8)).

Accordingly, while the Supreme Court has recognized an exception to § 101—borne of a concern of preemption—for "abstract ideas," the Court has "tread carefully" in construing the scope of that exclusionary principle "lest it swallow all of patent law." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014). "At some level, 'all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.'" *Id.* (quoting

Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289, 1293 (2012)). Hence, the Court has clarified that "an invention is not rendered ineligible for patent simply because it ***involves*** an abstract concept." *Id.* (emphasis added).

The two-step framework set forth in *Alice* ensures that the exclusion of abstract ideas does not unduly impinge on the constitutional and statutory objective of affording patent protection to a broad scope of subject matter. Under Step One of *Alice*, a court must ask whether the claims at issue are "directed to" an abstract idea. *Id.* at 2355. If so, the court must proceed to Step Two and examine "the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements" provide an "inventive concept"—i.e., whether they "'transform the nature of the claim' into a patent-eligible application." *Id.* (quoting *Mayo*, 132 S. Ct. at 1298, 1297). Thus, even a patent that is directed to a patent-ineligible concept would not be barred by the exclusionary principle if "the patent in practice amounts to significantly more than a patent upon" the basic building blocks of all human innovations. *Id.* (quoting *Mayo*, 132 S. Ct. at 1294).

Critically for this appeal, *Alice* does ***not*** "broadly hold that all improvements in computer-related technology are inherently abstract." *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). "Software can make non-abstract improvements to computer technology just as hardware improvements can," and

neither *Alice* nor any of this Court's cases excludes patenting a "large field of technological progress" involving software or computer technology. *Id.* at 1335, 1339.

A. The '955 Patent Claims Are Not Directed to an Abstract Idea

The '955 patent claims are directed to a concrete, technological invention: a specific set of components and steps that, together, constitute improved methods and systems for monitoring a user's interactions with the Internet in order to make a recommendation of a future Internet session path for that user. As demonstrated below, the claims themselves, the written description, and the file history all support that conclusion. The district court's finding at *Alice* Step One—that the claims are "directed to" an activity found only in the final element of the claims and described in the patent as mere post-solution activity—is incorrect and should be reversed.

1. The Patent Claims Are Directed to a Technological Improvement to Methods for Monitoring a User's Interactions with the Internet

Alice Step One "plainly contemplates that . . . a substantial class of claims are ***not*** directed to a patent-ineligible concept." *Enfish*, 822 F.3d at 1335. Hence, the inquiry "cannot simply ask whether the claims ***involve*** a patent-ineligible concept," but instead must inquire whether the claims "as a whole" are "***directed to***" an abstract idea. *Id.* (second emphasis added) (citation omitted). The '955

patent's claim language demonstrates that the claims are directed to a technological invention for solving an Internet-specific problem.

As a whole, claim 1 of the '955 patent (which the district court examined as representative) recites a system that is directed to a particular way of monitoring a user's interactions with the Internet and utilizing those interactions. The preambles of every independent claim recite a method or system "***for monitoring a user's interactions with Internet-based programs or documents***." Appx108(61:32-33, 62:25-27) (emphasis added); Appx109(64:8-10). Four out of the five elements in claim 1 pertain exclusively to specific steps for tracking and analyzing a user's interactions with the Internet. *See* Appx108(61:34-45). Thus, claim 1 is on its face directed to an improved technology for monitoring and interpreting user's interactions with Internet-based programs or documents, not "cross-channel customer service."

At most, "cross channel customer service" is a requirement of the claim's final limitation, which recites "providing the recommendation of the future session paths . . . to a contact center agent while the contact center agent is communicating with said user during a telephone call." *See id.* (61:46-50). Even in that limitation, however, the reference to providing the recommendation to a call center agent is mere post-solution activity, not the concept to which the claim, overall, is "directed." *See* Appx80(6:14-17); Appx81(7:46-48); Appx108(62:20-22

(describing alternative uses of the invention)). To the extent that "cross-channel customer service" can be used to describe claim 1, it is only in the sense that the invention as claimed "involves," rather than is "directed to," such a concept.[13] *See Enfish*, 822 F.3d at 1335 (noting that Step One is a "meaningful" inquiry that distinguishes "directed to" from "involve").

As stated above, the overwhelming majority of claim 1—and ***all*** portions of the claim that the applicants advocated were novel over the prior art during prosecution of the '955 patent—are instead directed to a specific way to monitor a user's interactions with the Internet and performing analysis to automatically generate a recommended path for future Internet use. First, claim 1 requires "extracting content from Internet server traffic according to predefined rules." Appx108(61:34-35). This involves the innovative step of ***selectively*** extracting only specific content from the captured Internet server traffic, which potentially

[13] The dictionary definitions of "direct to" and "involve" also support this distinction. Webster's Third New International Dictionary defines "direct," when it is used with "to," as "to devote with concentration" or "to aim fixedly: concern or involve oneself primarily or totally with." *Webster's Third New International Dictionary* 640 (3d ed. 2002). By comparison, "involve" is defined, in the relevant sense, as "to have within or as part of itself." *Id.* at 1191. Contrary to the district court's conclusion, the invention claimed in the '955 patent is "aim[ed] at," and concerned "primarily or totally with," improved monitoring of a user's interactions with the Internet in a useful way, rather than general, all-encompassing "cross-channel customer service." Indeed, the most that could be said about cross-channel customer service in regard to the invention is that the invention "ha[s] within or as part of itself" a functionality for such service.

consists of data from an enormous number of customers—e.g., 50 million. *See* Appx79(4:9-20); Appx80(6:54-67); Appx81(7:1-17); Appx92(30:53-55). Second, claim 1 requires that the system define "Internet interaction sessions" and "associat[e] the extracted content" with one or more of those defined sessions. Appx108(61:36-37). Third, the claim requires that the Internet interaction sessions be stored and indexed in an unconventional manner—i.e., on a session-by-session basis, and according to predefined rules—so that the relevant interaction session information can be retrieved through a search for a relevant storage rule. Appx94(34:22-27, 34:41-44); Appx108(61:38-39). Fourth, the claim requires "automatically ***comparing***, by a web analyzer using a processor, one or more of the user's Internet interaction sessions to one or more ***modeled sessions*** to generate a recommendation of one or more future session paths from the modeled sessions for guiding the user's Internet interactions." Appx108(61:40-45) (emphasis added). As is evident from the language of these claim limitations, *see supra* pp. 19-20, each limitation includes components and processes that are critical for harnessing the web-usage data created by the Internet, not for performing "some business practice known from the pre-Internet world along with the requirement to perform it on the Internet." *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014); *Enfish*, 822 F.3d at 1339 ("[W]e are not faced with a situation

where general-purpose computer components are added post-hoc to a fundamental economic practice or mathematical equation.").

The '955 patent's written description further demonstrates that the claims are directed to a concrete, technological invention. The Abstract, for example, describes the invention as "[a] device, system and method . . . for "***monitoring a user's interactions with Internet-based programs or documents***." Appx21(Abstract) (emphasis added); *see also* Appx78(1:47-49) (Summary of the Invention). Similarly, the Field of Invention states that the invention "relate[s] to systems and methods ***for web or Internet traffic capture*** using passive sniffing, configuration and web elements capture, web elements extraction and analysis, session management, customer resolving, web content viewing and client notification based on the customer's web browsing." Appx78(1:7-12) (emphasis added). The Detailed Description of the Invention echoes this description, noting that the "invention provide[s] a system and method for ***tracking and analyzing interactions of each customer over the World Wide Web***." Appx79(3:66-4:5) (emphasis added); *see also* pp. 15-19 (summarizing '955 patent written description in greater detail).

The '955 patent's prosecution history also confirms that the claimed invention is directed to a technological solution to an Internet-specific problem, as distinct from the prior art. This Court has observed that the Step One analysis

should "inquir[e] into the focus of the claimed advance over the prior art." *Enfish*, 822 F.3d at 1335 (internal quotation marks omitted). The focus of the invention claimed in the '955 patent is to combine web-based tools and processes in a unique way so as to overcome the particular technological challenges exclusive to the Internet, which the prior art methods were unable to do. *See* Appx514-515 (noting the prior art methods were limited because they could only monitor "raw, unfiltered records of Internet server traffic" and were unable to extract useful data); Appx514; Appx525 (noting that the invention could automatically analyze user data, unlike prior art methods where a human agent was assigned to monitoring and manually analyzing user interactions on the web); Appx458 (noting that the invention could produce a new recommendation, whereas a prior art method only produced recommendations of websites that the user had already tried).

The claims, written description, and file history of the '955 patent thus clearly distinguish this case from the cases on which the district court relied in finding that the patent is directed to an abstract idea. For example, unlike the patents in *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir. 2016), which claimed systems for "collecting information, analyzing it, and displaying certain results" without "any particular assertedly inventive technology for performing those functions," *id.* at 1353, 1354, the '955 patent claims systems and methods for harnessing the massive and disparate user data from the web in a

way that overcomes the technological deficiencies of the prior art. *See also Content Extraction & Transmission LLC v. Wells Fargo Bank, N.A.*, 776 F.3d 1343, 1347 (Fed. Cir. 2014) (holding that the patent at issue is "drawn to the abstract idea of 1) collecting data, 2) recognizing certain data within the collected data set, and 3) storing that recognized data in a memory," functions that "humans have always performed"). Moreover, the claimed invention of the '955 patent does not use any specific customer's "navigation history" or preexisting "user-specific information" in "customiz[ing]" results, nor does the invention merely improve an existing business practice, such as "budgeting." *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1365, 1367-1368 (Fed. Cir. 2015).

Similarly, the claims in the '955 patent do not simply "requir[e] conventional computer activities or routine data-gathering steps," *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015), but rather require specific technological components that, both individually and as an ordered combination, embody an improvement over the prior art. Indeed, as in *Enfish*, the computer components recited in the '955 patent are not invoked "merely as a tool" for improving a preexisting business practice, but as necessary constituents of a

technology-based solution that addresses a unique challenge arising from the technology itself.[14] *Enfish*, 822 F.3d at 1336.

When examined "as a whole," therefore, the '955 patent claims are directed to a concrete, technological solution to a problem inherent in monitoring a user's interactions with the Internet. That the invention can be used to address a business challenge associated with Internet commerce does not change the technological nature of the invention. *See DDR Holdings*, 773 F.3d at 1257 ("Although the claims address a business challenge (retaining website visitors), it is a challenge particular to the Internet.").

2. The District Court Removed the Claims from Their Technological Context to Find That They Are Directed to the Abstract Idea of "Cross-Channel Customer Service"

Contrary to the patent disclosure described above, the district court determined that all twenty-nine claims of the '955 patent are directed to the abstract idea of "cross-channel customer service"—i.e., "gathering customer information from one communication channel and using it to engage the customer via another communication channel." Appx7 (footnote omitted); *see also* Appx11.

[14] The district court incorrectly read *Enfish* as requiring that an invention involving computer components outline a "specific improvement in computer capabilities" in order to not be directed to an abstract idea. Appx10. While the patent in *Enfish* claimed an improvement in the functionality of computer database software, claims need not recite such an improvement to be patent eligible. *See Enfish*, 822 F.3d at 1336, 1335 (noting that *Alice* does not "broadly hold that all improvements in computer-related technology are inherently abstract and, therefore, must be considered at step two").

The district court reached that conclusion by analyzing the claims without giving meaningful consideration to their technological requirements. *See* Appx9. The district court's Step One analysis is flawed and its conclusion is incorrect.

As an initial matter, the phrase "cross-channel customer service" is mentioned nowhere in the patent, let alone in the claims. As discussed above, the claims instead recite methods and systems for "monitoring a user's interactions with Internet-based programs or documents" and using the data generated therefrom to make recommendations regarding users' future session paths. *See supra* pp. 33-39; *see also* Appx108(61:32-50, 62:28-43); Appx109(64:11-27). The specification is at all times consistent with that recitation. *See, e.g.*, Appx78(1:7-12); Appx79(3:66-4:5).

More generally, the district court oversimplified the claimed invention by purporting to strip away "generic computer components and limitation to a particular technological environment." Appx9. Rather than remove generic computer components, however, the district court took this as a license to ignore the bulk of the claim requirements and all of their inventive and unconventional features, in contravention of this Court's mandate not to "describ[e] the claims at such a high level of abstraction and untethered from the language of the claims." *Enfish*, 822 F.3d at 1337 (cautioning that such an approach "all but ensures that the exceptions to § 101 swallow the rule"); *McRO, Inc. v. Bandai Namco Games Am.*

Inc., 837 F.3d 1299, 1313 (Fed. Cir. 2016) ("We have previously cautioned that courts must be careful to avoid oversimplifying the claims by looking at them generally and failing to account for the specific requirements of the claims." (internal quotation marks omitted)). Indeed, the district court failed entirely to account for the specific requirements of the first, second, and third limitations of claim 1.

The district court's failure to appreciate the technical aspects of the invention is manifestly apparent in its misguided car dealership analogy. The district court found—without any citation to the patent or its file history—that the patented invention could be analogized to the following scenario: (1) a single customer walks into a car dealership and looks at multiple cars, while directly communicating with Salesman A about what features the customer is interested in; (2) after the customer leaves, Salesman A remembers that other customers who looked at similar cars as the customer in question generally liked 2014 WonderCar SLE and notes this recommendation in the customer file; and (3) later, when the customer calls the dealership to ask a few questions, Salesman B answers and proceeds to recommend 2014 WonderCar SLE upon consulting the file. *See* Appx9. The district court found that, "[a]side from the use of automation via generic computer components to increase efficiency," this simple brick-and-motor analogy accurately characterizes the '955 patent. *Id.*

But this analogy fails on multiple levels. First, unlike the dealership store in the district court's analogy, the Internet environment which the '955 patent addresses exclusively welcomes ***millions*** of different users simultaneously, not just a single customer. Long before the '955 patent, technology existed for a sales representative to monitor a single Internet user's interactions. *See, e.g.*, *supra* pp. 8-9 (describing Costigan reference). The problem that the inventors of the '955 patent addressed, however, is fundamentally different and is rooted in the massive amount of data generated by a ***multitude*** of users (the '955 patent suggests up to 50 million users) on the Internet. *See* Appx88(22:42-48); Appx92(30:53-55); Appx458; Appx453; Appx514-516 (noting the limitations of the prior art methods in harnessing the web user data). As discussed above, this is a very challenging problem that is inherent in the technology itself, *see supra* pp. 5-6, and the district court ignored that challenge in its oversimplified car dealership analogy.

Second, in the district court's analogy, the single customer tells Salesman A in which features the customer is interested. But again, this hypothetical is inapposite because it ignores the actual problem addressed by the claimed invention. The information generated by Internet server traffic is fragmented and disparate. Unlike the customer in the analogy who conveys a small list of specifically identified "features" that are most important to him or her, an Internet user navigates—oftentimes erratically and across multiple browsing sessions—a

series of webpages that may not bear any relationship to one another, making it difficult to determine which data, if any, is significant. *See supra* p. 6. The '955 patent is designed to address this particular challenge of identifying and isolating—from massive and disparate data—Internet server traffic information that may have commercial significance. Thus, claim 1 recites "extracting" relevant data according to predefined rules, such as "the presence or frequency of certain keywords," Appx79(4:9-17); Appx80(6:54-67); Appx81(7:1-3), and associating that data—which is usually in the form of "metadata, embedded tags, URLs or other information"—with an "Internet interaction session" that can be meaningfully utilized, Appx81(7:9-17). This is fundamentally different, and substantially more challenging, than writing down the handful of product features in which a single customer directly expresses interest.

Third, in the district court's analogy, the customer's interests are unambiguous. The customer who visits a car dealership is unambiguously interested in purchasing a new car. Moreover, the hypothetical customer in the district court's analogy communicates interest in certain features that are important to him or her, which enables Salesman A to make a purchase recommendation based on other customers who have manifested interest in a car with the same features. This aspect of brick-and-mortar sales, however, is wholly inapposite to the problem addressed by the '955 patent. As explained previously, Internet

interaction data is frequently ambiguous, and oftentimes no specific product recommendation can be made by reviewing the history of which webpages a user has visited. *See supra* p. 7. That is why, in the '955 patent claims, the user's Internet interaction session data is compared to modeled sessions that are aggregated from millions of past users. Unlike in the car dealership analogy, the purpose of this comparison is to suggest an optimal future Internet session path.

In short, the district court's missteps at Step One of *Alice*, including its lack of evaluation of the technological components of the claims and inapposite car dealership analogy, led to the court's failure to appreciate the technological challenges uniquely associated with harnessing Internet interaction data—challenges that simply do not arise in the brick-and-mortar context. *See DDR Holdings*, 773 F.3d at 1258 (criticizing a brick-and-mortar analogy made by the dissent for failing "to account for the ephemeral nature of an Internet 'location' or the near-instantaneous transport between these locations made possible by standard Internet communication protocols"). Fairly read, the '955 patent's claim language, specification, and file history all demonstrate that the claims are not directed to any abstract idea, much less the abstract idea of "cross-channel customer service."

B. The '955 Patent Claims Recite Inventive Concepts

Even assuming (incorrectly) that the claims could properly be described as "directed to" nothing more than an abstract concept, the '955 patent does not claim

patent-ineligible subject matter at *Alice* Step Two because the claims contain inventive concepts. Specifically, the claims recite web-based tools that operate in an unconventional manner to improve upon the prior art. At a minimum, the novel arrangement of the claimed components as an ordered combination provides an inventive concept. In its Step Two *Alice* analysis, however, the district court failed to identify these inventive concepts because it evaluated only one claim limitation and ignored all others and also failed to address the claims as an ordered combination. The court's finding is flawed and warrants reversal.

1. Claim 1 of the '955 Patent Recites Inventive Features that Distinguish It from Conventional Systems for Monitoring Internet Interactions

Under *Alice* Step Two, a court searches for an "inventive concept"—i.e., "specific improvements in the recited computer technology [that] go beyond 'well-understood, routine, [and] conventional activit[ies].'" *BASCOM*, 827 F.3d at 1348 (quoting *Alice*, 134 S. Ct. at 2359). The '955 patent contains multiple such inventive concepts.

a. The claim limitations are individually innovative

The '955 patent's written description and file history demonstrate that, while the claims recite methods and systems using some of the very same components and processes as recited in the prior art, those components operate in a far different

manner. *See supra* pp. 8-13 (describing networks, capture servers, databases, and data extraction techniques in prior art systems).

For instance, claim 1 of the ’955 patent first recites “extracting content from Internet server traffic according to predefined rules” using a web analyzer that can include passive sniffing devices or probes. Appx108(61:34-35); *see also* Appx79(4:5-9, 4:20-22, 4:57-60); Appx80(5:25, 5:46-53, 6:44-47); Appx82(10:31-40); Appx89(24:36-42); Appx93(32:60-61). As indicated by the ’955 patent’s written description, unlike prior art systems (e.g., the system described in Vincent), the claimed invention of the ’955 patent ***selectively*** extracts data from captured Internet server traffic “according to predefined rules,” which can include, for example, “the presence or frequency of certain keywords.” Appx21(Abstract); Appx79(4:9-20); Appx80(6:54-67); Appx81(7:1-3). This enables the system to extract only potentially relevant data to generate a particular recommendation as described in the claims, while at the same time preventing the system from having to process Internet interaction information that is not pertinent. In contrast to past decisions in which this Court has affirmed a finding of subject matter ineligibility at the motion to dismiss stage, *see, e.g.*, *In re TLI Commc’ns LLC Patent Litig.*, 823 F.3d 607, 613-614 (Fed. Cir. 2016) (noting that claimed features were described in the patent specification itself as conventional), there is no basis in the ’955 patent written description for concluding that the improved data extraction

technique claimed in the first element of claim 1 is not an inventive concept. To the contrary, the applicants argued during prosecution that conventional systems lacked such technology. *See* Appx514-515.

Claim 1 next requires that the collected data be associated "with one or more of a user's Internet interaction sessions." Appx108(61:36-37); *see also* Appx81(7:15-17); Appx83(11:18-23); Appx89(24:53-59). Critically, data is associated based on a user's Internet ***interaction sessions***, which are different from a user's Internet browsing sessions that were used to generate recommendations in the prior art. Indeed, whereas a user's Internet interaction sessions can be defined to include a variety of interaction information (e.g., logging on and off, frequenting a website a certain number of times, closing the web browser, etc., *see* Appx79(4:29-35)), a user's web-browsing history is limited to only a list of webpages that the visitor previously visited, *see supra* pp. 10-13 (describing Vincent system in which the source of data includes only the user's web-browsing history). This, again, is an unconventional technique that is not characterized in the '955 patent's written description as a generic computing operation. *See, e.g.*, Appx84(13:34-41) ("Once the sessions are defined, data extractor and/or post extractor may selectively identify, filter, save or extract web interactions according to rules via configuration loader. . . . Data extractor and post extractor may divide the extracted content into sessions, for example, as defined by session manager.").

Claim 1 also recites "storing and indexing" the Internet interaction sessions data using, for example, an interactions database. Appx108(61:38-39); *see also* Appx81(7:15-17); Appx83(11:18-23); Appx89(24:53-59). While prior art systems (e.g., Vincent) included databases to capture a user's unanalyzed Internet interaction data, the '955 patent describes use of an ***additional*** database that stores and indexes "Internet interaction sessions" ***after*** the user data has already been partially analyzed and filtered. *See* Appx84(13:41-45) ("Session manager may provide the session details to perform adapter, which may transmit the details to interaction center, for example, via CAPI, to organize the interactions database into sessions or retrieve data based on the sessions"); *see also, e.g.*, Appx79(4:36-37) (describing "session summaries" that can be used to facilitate the required indexing). *Compare supra* p. 15 (annotated diagram of '955 patent Figure 4, showing the "interactions database" highlighted in yellow, in contrast to the "capture database" highlighted in blue), *with supra* p. 12 (annotated Figure 1 of Vincent, containing a capture database but nothing akin to an interactions database).[15] In this regard, the '955 patent claims specifically require that Internet

[15] Vincent includes a "CPM database," but that database does not store or index Internet interaction sessions. Rather, it stores the sales presentations and/or sales scripts that will be suggested to the customer service representatives. *See* Vincent ¶ 29. The information stored in the CPM database is not subject to further analysis by the data analysis tools of Vincent, as indicated by the absence of any connection between them in Figure 1 of Vincent.

interaction data be stored on a session-by-session basis and indexed. This separate storage of Internet interaction data according to "sessions" enables the claimed system to perform the specific analysis recited in the claim limitation that immediately follows.

That fourth claim limitation recites a web analyzer that "automatically compar[es] . . . one or more of the user's Internet sessions to one or more modeled sessions to generate a recommendation of one or more future session paths from the modeled sessions." Appx108(61:40-45); *see also* Appx80(5:9-24). Modeled sessions are complex algorithmic machine learning tools built using data aggregated from "real-life session summaries generated by other satisfied customers," and are "retrieved from a pool of session histories that most closely matches the topics, key-wor[d]s and/or other features used in the current customer's session." Appx80(5:13-20); Appx109(63:6-8). Modeled sessions may include "a linear path of webpages to browse" or may include "tree-structured or matrix paths, where each chosen webpage path leads to different options, and thus different outcomes." Appx80(5:20-24).

Unlike conventional systems, which utilized a user's web-browsing history to recommend that the user re-try certain websites that he or she had visited in the past, the web analyzer in the '955 patent allows the system to automatically compare the particular user's Internet interactions to modeled sessions compiled

from the collected data. Appx80(5:9-24); Appx460; Appx514-516; Appx525. Each path actually chosen by the user leads to a different recommendation as to which path the user should choose in the future. *See* Appx80(5:20-24); Appx109(63:19-22). This enables the system to recommend a specific Internet browsing path that the user should follow during a future session—a functionality that is entirely missing from conventional systems. *See* Appx108(61:42-45); *see also* Appx453; Appx458.

Finally, the claim requires that the recommendation be provided "on screen to a contact center agent while the contact center agent is communicating with said user during a telephone call initiated by the user." Appx108(61:46-50); *see also* Appx82(10:4-11); Appx83(11:62-12:45); Appx91(28:34-35). As discussed above, providing information to a call center agent is not inventive, and the applicants for the '955 patent have never argued otherwise. But, due to the improved monitoring technology described in the remainder of claim 1, the system in the '955 patent enables a sales agent to make the recommendation in real time based on the customer's current Internet browsing, during a subsequent call initiated by the customer. *See* Appx515-517; Appx83(12:28-30) (noting that the sales agent "may also be provided with a guide updated in real-time with recommendations targeted to the user's real-time interactions").

Taken individually, each of the claim limitations recites a substantial and technological improvement over the prior art. *See Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1050 (Fed. Cir. 2016) (upholding claims where "[t]he benefits of the improved process over the prior art methods are significant"); *BASCOM*, 827 F.3d at 1350 ("Filtering content on the Internet was already a known concept, and the patent describes how its particular arrangement of elements is a technical improvement over prior art ways of filtering such content."); *McRO*, 837 F.3d at 1314 (upholding claims reciting technological benefits over prior art systems for automatically animating lip synchronization and facial expression of animated characters). Thus, the claims of the '955 patent are not directed to ineligible subject matter at *Alice* Step Two.

b. The ordered combination of claim limitations is technologically unconventional

But even if none of the claim limitations standing alone were individually inventive, at a minimum, the ordered combination of the claim limitations reflects a specific, patent-eligible improvement over preexisting methods and systems. Indeed, this Court has recently upheld claims directed to similarly unconventional configurations of computer components for harnessing massive and disparate network-usage data in real time in *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288 (Fed. Cir. 2016).

In *Amdocs*, the Court reversed the district court's ruling that four patents related to "parts of a system designed to solve an accounting and billing problem faced by network service providers" were unpatentable under § 101. *Id.* at 1291. The claim limitations at issue in *Amdocs* recited generic computer components, "including network devices and 'gatherers' which 'gather' information," that were "arrayed in a distributed architecture" so that "network usage information is collected in real-time from a plurality of network devices at a plurality of layers." *Id.* at 1300, 1291, 1303. Some claims also required that the data be "filtered and aggregated before being completed into a plurality of data records." *Id.* at 1303.

Despite the involvement of certain "generic components," *id.* at 1300, however, the Court found that they "operate in an unconventional manner to achieve an improvement in computer functionality"—i.e., by overcoming the "technological problem" of harnessing "massive record flows" generated from network usage, "which previously required massive databases," *id.* at 1300-1301, 1300, 1306. *Amdocs*' analysis and holding is consistent with this Court's (and lower courts') determinations in other cases involving Internet technology. *See, e.g.*, *BASCOM*, 827 F.3d at 1350 (upholding claims that "harness[ed] [a] technical feature of network technology in a filtering system by associating individual accounts with their own filtering scheme and elements while locating the filtering system on an ISP server"); *TNS Media Research LLC v. TIVO Research &*

Analytics, Inc., 2016 WL 6993768, at *4-6 (S.D.N.Y. Nov. 29, 2016) (upholding claims directed toward "a computer implemented method for facilitating analysis of consumer behavior" by collecting "clickstream data" from users, so as to allow advertisers to "access advertising measurement with associated calculations, metrics, and data processing on a real-time basis").

The '955 patent claims are similar to the *Amdocs* claims—they recite an unconventional ordered combination of web-based tools and processes for tracking and analyzing massive data flows generated from Internet usage. That particular combination of elements allows the system to monitor individual users' web behavior in a way that was simply unobtainable in prior art methods. For that reason, the claims are ***unlike*** the claims at issue in cases on which the district court relied at *Alice* Step Two. In those cases, the claims merely applied well-understood brick-and-mortar concepts and technology to computer or Internet environments. *See, e.g.*, *Content Extraction*, 776 F.3d at 1345, 1348 (method for "extracting data ***from hard copy documents*** using an automated digitizing unit such as a scanner" (emphasis added)); *Intellectual Ventures*, 792 F.3d at 1369-1370 ("an interactive interface" for delivering "***pre-designed advertisements***" to customers through webpages (emphasis added)); *Elec. Power Grp.*, 830 F.3d at 1354, 1355 ("a process of gathering and analyzing information of a specified content, then displaying the results" in a manner that does "***not even require a new***

source or type of information, or new techniques for analyzing it" (emphasis added)). Here, by contrast, the '955 patented invention overcomes a technological problem ***inherent in, and created by, the Internet itself*** that, prior to the patent, limited the Internet's efficacy as a cross-channel customer service tool (even under the district court's erroneous characterization of the abstract concept of the claims). *See Amdocs*, 841 F.3d at 1300, 1306; *DDR Holdings*, 773 F.3d at 1257 (noting that the invention is "necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of" the Internet).

Thus, even if this Court were to find that the '955 patent claims recite generic computer components, the patent and the file history demonstrate that these components collectively interact to control the massive and disparate web-usage data generated by the Internet in a technologically unconventional manner. The claims, therefore, provide an inventive concept at *Alice* Step Two.

2. The District Court Considered Only Some of the Claim Limitations and Wholly Failed to Consider Those Limitations as an Ordered Combination

Rather than assessing all claim limitations—and the unconventional manner in which the components and processes recited therein are used and employed—the district court ignored the first three limitations of representative claim 1 entirely, analyzing only the "web analyzer" and "modeled sessions" portions of the fourth claim limitation. *See* Appx13; Appx17-18. Moreover, even with respect to

those portions of that single limitation, the district court analyzed them individually and sequentially, incorrectly concluding that each, standing alone, was well known and conventional. *See, e.g.*, Appx13 (analyzing "web analyzer using a processor" standing alone and concluding that it "simply describes using a generic processor to speed up an analytical process"); Appx17 (analyzing "modeled sessions" standing alone); *see also* Appx18-19 (analyzing limitations recited in dependent claims individually and separate from limitations recited in independent claims). That analysis is flawed.

First, contrary to *Alice*'s instruction, the district court's analysis is improperly selective—it only addresses certain portions of a single claim limitation, to the exclusion of analyzing the remainder of the representative claim. *See Alice*, 134 S. Ct. at 2359 (analyzing "***each step***" of the representative claim at Step Two of the § 101 analysis (emphasis added)); *McRO*, 837 F.3d at 1313 (cautioning that courts should not "ignor[e] the requirements of the individual steps" recited in claims). Specifically, although the district court separately analyzed the claimed "web analyzer using a processor" to perform a comparison to "modeled session" and concluded that those two terms within a single claim limitation individually fail to provide an inventive concept, *see* Appx13; Appx17-18, the court made no mention whatsoever of the preceding three claim limitations: (1) "extracting content from the Internet server traffic according to predefined

rules"; (2) "associating the extracted content with one or more of a user's Internet interaction sessions"; and (3) "storing and indexing the user's Internet interaction sessions," Appx108(61:34-39).

The omitted limitations are important to the overall invention recited by the claims. As discussed above, the limitations require that web-usage data be selectively extracted from many users' interactions with many websites across the Internet, associated with individual Internet interaction sessions, and that those Internet interaction sessions be indexed in such a way as to facilitate a comparison to modeled sessions. These claim limitations collectively allow the system to provide, in real time, analytics derived from massive, disparate, and ambiguous data generated from millions of Internet users' web activity. These features are also some of the very ones that the applicants narrowed during prosecution to distinguish the '955 patent from the prior art.

Compounding this error, the district court incorrectly interpreted the role of the "modeled sessions"—one of the two terms the court did address—in the claimed invention. Appx18. The fourth claim limitation does not merely perform a statistical analysis or prediction. Rather, the limitation compares a user's Internet interaction sessions to "ideal session histories" (i.e., modeled sessions) that are aggregated from "real-life session summaries generated by other satisfied customers." Appx80(5:13-17).

Second, the district court's analysis is impermissibly narrowly focused in that it evaluates some claim limitations standing alone, but fails to account for the broader unconventional manner in which those claim limitations interact. The Supreme Court unequivocally held in *Alice* that, to determine whether a patent claim provides an inventive concept, a court must "consider elements of [the] claim ***both*** individually ***and 'as an ordered combination***.'" *Alice*, 134 S. Ct. at 2355 (emphasis added) (quoting *Mayo*, 132 S. Ct. at 1298). Indeed, "a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made." *Diamond v. Diehr*, 450 U.S. 175, 188 (1981). This Court has similarly recognized that "[t]he inventive concept inquiry requires more than recognizing that each claim element, by itself, was known in the art." *BASCOM*, 827 F.3d at 1350 ("[A]n inventive concept can be found in the non-conventional and non-generic arrangement of known, conventional pieces."); *CellzDirect*, 827 F.3d at 1051 ("That each of the claims' individual steps . . . were known independently in the art does not make the claim unpatentable.").

But that is precisely what the district court did. By analyzing only two claim terms within a single claim limitation, the court failed to analyze the claims "as an ordered combination." *Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 132 S. Ct. at 1298). In fact, that phrase (in any locution) does not appear anywhere in the

district court's memorandum opinion except in the boilerplate Legal Standard section. *See* Appx3. Had the court considered all the claim limitations collectively, it would have arrived at the inescapable conclusion that the claims do more than merely apply cross-channel marketing to the Internet. *See* Appx11; *see also supra* pp. 46-54.

Finally, the district court's flawed Step Two analysis led to an incorrect conclusion about the claims' preemptive scope. The court found that the claims could "largely preempt the integrated sales and customer service approaches of most modern businesses" by "sweep[ing] in any form of Internet-connected activity." Appx16. This is wrong. The claims recite a specific structure of various components and features (web analyzer, Internet server traffic, sniffers, modeled sessions, workstations, etc.).[16] *See, e.g.*, Appx108(61:34 (Internet server traffic), 61:40 (web analyzer), 61:42 (modeled sessions), 62:12 (passive sniffing device),

[16] To support its preemption conclusion, the district court determined that "the specification describes the 'web analyzer' in terms of its basic functions, rather than anything significant about the technology itself." Appx17 (quoting Appx79(4:52-56)). The district court's characterization is incorrect. The '955 patent specification describes in great detail the web analyzer's functionality ("analyze the data, identify, filter, save or extract interesting elements, such as, products and products prices, that satisfy, match or correspond to rules set by a rule manager and create user session"), its structure ("Web analyzer may include a data provider, a session manager, an open sessions database, a data extractor, a post extractor, a configuration loader and a perform adapter including a CAPI."), and its interface (e.g., "Web analyzer may include an interface with connection server to supply users' current open sessions to connection server, for example, as described in reference to FIGS. 6-9."). *See* Appx82(10:52-57); Appx84(13:19-23, 14:20-23).

62:65 (workstation)); Appx109(63:20 (dynamic tree-structure of paths), 63:21-22 (predicted modeled future session path), 64:6 (web elements)). These components form a system for monitoring and analyzing web-usage information and, collectively, carve out a specific configuration by which that is achieved. In fact, the prior art discussed during prosecution of the '955 patent alone provides numerous examples of custom online customer service techniques that are ***not*** covered by the patent claims. *See supra* pp. 8-9 (describing Costigan reference, which discloses generating a recommendation based on a human agent's review of a user's interaction with a particular website). Hence, the '955 patent does not unduly preempt the use of cross-channel marketing in all fields, nor does it "tend to impede innovation more than it . . . tend[s] to promote it." *Mayo*, 132 S. Ct. at 1293.

CONCLUSION

For the foregoing reasons, NICE respectfully requests that the Court reverse the district court's judgment.

Respectfully submitted,

/s/ *Gregory H. Lantier*

GUY YONAY
DAVID A. LOEWENSTEIN
CLYDE A. SHUMAN
PEARL COHEN ZEDEK LATZER
BARATZ LLP
1500 Broadway, 12th Floor
New York, NY 10036
(646) 878-0800

GREGORY H. LANTIER
RICHARD A. CRUDO
HYUN GYO CHUNG
WILMER CUTLER PICKERING
HALE AND DORR LLP
1875 Pennsylvania Avenue, NW
Washington, DC 20006
(202) 663-6000

S. CALVIN WALDEN
WILMER CUTLER PICKERING
HALE AND DORR LLP
250 Greenwich Street
New York, NY 10007
(212) 937-7215

Attorneys for Plaintiffs-Appellants

January 12, 2017

ADDENDUM

TABLE OF CONTENTS

Page(s)

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

NICE SYSTEMS LTD. and NICE SYSTEMS, INC.

Plaintiffs,

v.

CLICKFOX, INC.,

Defendant.

Civil Action No. 15-743-RGA

MEMORANDUM OPINION

Jack B. Blumenfeld, Esq., MORRIS, NICHOLS, ARSHT & TUNNELL LLP, Wilmington, DE; Guy Yonay, Esq., Clyde A. Shuman, Esq., PEARL COHEN ZEDEK LATZER BARATZ LLP, New York, NY.

Attorneys for Plaintiffs Nice Systems Ltd. and Nice Systems, Inc.

Mary W. Bourke, Esq., Daniel M. Attaway, Esq., WOMBLE CARLYLE SANDRIDGE & RICE, LLP, Wilmington, DE; Douglas D. Salyers, Esq., James E. Schutz, Esq., Puja Patel Lea, Esq., Dustin B. Weeks, Esq., TROUTMAN SANDERS LLP, Atlanta, GA; Anup M. Shah, Esq. TROUTMAN SANDERS LLP, Charlotte, NC.

Attorneys for Defendant Clickfox, Inc.

September 15, 2016

ANDREWS, U.S. DISTRICT JUDGE:

Presently before the Court are Defendant's two motions to dismiss for failure to state a claim. (D.I. 17, 20). The issues have been fully briefed. (D.I. 18, 21, 23, 25, 27, 28). The Court held oral argument on April 22, 2016. (D.I. 30). For the reasons that follow, the Court will grant Defendant's motion as to patentable subject matter and dismiss as moot Defendant's motion for failure to state a claim of induced infringement.

I. BACKGROUND

Plaintiffs filed this patent infringement lawsuit against Defendant on August 27, 2015. (D.I. 1). Plaintiffs originally asserted that Defendant infringed "at least claim 12" of U.S. Patent. No. 8,976,955 ("the '955 patent"). (*Id.* at 5, ¶ 23). Thereafter, Defendant filed a motion to dismiss alleging that claim 12 of the '955 patent was directed to patent-ineligible subject matter and that the complaint failed to state a claim of induced infringement. (D.I. 9, 10). Plaintiffs then filed an Amended Complaint on November 16, 2015. (D.I. 14). Defendant subsequently filed the two instant motions to dismiss the Amended Complaint. (D.I. 17, 20).

The '955 patent is directed to a system and method of tracking user web interactions and using that information to generate real-time recommendations when a contact center agent is later contacted by that user. (*See, e.g.*, '955 patent abstract; *id.* claim 1). The summary of the invention section of the specification describes the invention as follows:

> A device, system, and method is provided for monitoring a user's interactions with Internet-based programs or documents. Content may be extracted from Internet server traffic according to predefined rules. Extracted content may be associated with a user's Internet interaction. The user's Internet interaction may be stored and indexed. The user's Internet interaction may be analyzed to generate a recommendation provided to a contact center agent while the contact center agent is communicating with said user, e.g., in real-time, for guiding the user's Internet interaction. Traffic other than Internet server traffic may also be used.

('955 patent, col. 1, ll. 45–57).

II. LEGAL STANDARD

Section 101 of the Patent Act defines patent-eligible subject matter. It provides: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. The Supreme Court has recognized an implicit exception for three categories of subject matter not eligible for patentability—laws of nature, natural phenomena, and abstract ideas. *Alice Corp. Pty. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014). The purpose of these carve outs is to protect the "basic tools of scientific and technological work." *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012). "[A] process is not unpatentable simply because it contains a law of nature or a mathematical algorithm," as "an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id.* at 1293-94 (internal quotation marks and emphasis omitted). In order "to transform an unpatentable law of nature into a patent-eligible application of such a law, one must do more than simply state the law of nature while adding the words 'apply it.'" *Id.* at 1294 (emphasis omitted).

The Supreme Court recently reaffirmed the framework laid out in *Mayo* "for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice*, 134 S. Ct. at 2355. First, the court must determine whether the claims are drawn to a patent-ineligible concept. *Id.* If the answer is yes, the court must look to "the elements of the claim both individually and as an 'ordered combination'" to see if there is an "'inventive concept'—*i.e.*, an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to

significantly more than a patent upon the [ineligible concept] itself.'" *Id.* (alteration in original). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Id.* at 2357 (alterations in original) (quoting *Mayo*, 132 S. Ct. at 1297). "[S]imply appending conventional steps, specified at a high level of generality, to . . . abstract ideas cannot make those . . . ideas patentable." *Mayo*, 132 S. Ct. at 1300. Further, "the prohibition against patenting abstract ideas cannot be circumvented by attempting to limit the use of [the idea] to a particular technological environment." *Alice*, 134 S. Ct. at 2358 (quoting *Bilski v. Kappos*, 561 U.S. 593, 610-11 (2010)). Thus, "the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention." *Id.* For this second step, the machine-or-transformation test can be a "useful clue," although it is not determinative. *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014), *cert. denied*, 135 S. Ct. 2907 (2015).

Patent eligibility under § 101 is a question of law suitable for resolution on a motion to dismiss. *See OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362 (Fed. Cir. 2015); *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, 776 F.3d 1343, 1346 (Fed. Cir. 2014), *cert. denied*, 136 S. Ct. 119 (2015). The Federal Circuit follows regional circuit law for motions to dismiss. *Content Extraction*, 776 F.3d at 1346. When reviewing a motion to dismiss pursuant to Federal Rule of Civil Procedure 12(b)(6), this Court must accept the complaint's factual allegations as true. *See Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 555-56 (2007).

The Federal Circuit has held that the district court is not required to individually address claims not asserted or identified by the non-moving party, so long as the court identifies a

representative claim and "all the claims are substantially similar and linked to the same abstract idea." *Content Extraction*, 776 F.3d at 1348 (internal quotation marks omitted).

III. DISCUSSION

The '955 patent contains three independent claims: claim 1, claim 12, and claim 29. At oral argument, Plaintiffs agreed that claim 1 or claim 12 would be representative. (D.I. 30 at 28–29). Claims 1 and 12 are nearly identical, aside from claim 1 being directed toward a "method" and claim 12 being directed toward a "system":

Claim 1	Claim 12
1. A method for monitoring a user's interactions with Internet-based programs or documents, the method comprising: extracting content from Internet server traffic according to predefined rules; associating the extracted content with one or more of a user's Internet interaction sessions; storing and indexing the user's Internet interaction sessions; automatically comparing, by a web analyzer using a processor, one or more of the user's Internet interaction sessions to one or more modeled sessions to generate a recommendation of one or more future session paths from the modeled sessions for guiding the user's Internet interactions; and providing the recommendation of the future session paths from the modeled sessions on screen to a contact center agent while the contact center agent is communicating with said user during a telephone call initiated by the user between the agent and the user.	12. A system for monitoring a user's interactions with Internet-based programs or documents, the system comprising: a processor to extract content from Internet server traffic according to predefined rules, associate the extracted content with one or more of a user's Internet interaction sessions, index the user's Internet interaction sessions, automatically compare one or more of the user's Internet interaction sessions to one or more modeled sessions by executing a web analyzer to generate a recommendation of one or more future session paths from the modeled sessions for guiding the user's Internet interactions and to provide the recommendation of the future session paths from the modeled sessions on screen to a contact center agent while the contact center agent is communicating with said user during a telephone call initiated by the user between the agent and the user; and a storage device to store the one or more of the user's Internet interaction sessions.

Claim 29 is nearly identical to claim 1, aside from not requiring that the user's Internet interaction sessions be compared to one or more "modeled sessions." (*Id.* claim 29). Instead, claim 29 more generally requires that the web analyzer analyzes the Internet interaction sessions to generate a recommendation. (*Id.*).

A. *Mayo/Alice* Step One: Abstract Idea

"First, we determine whether the claims at issue are directed to [an abstract idea]." *Alice*, 134 S. Ct. at 2355. "The 'abstract ideas' category embodies 'the longstanding rule that an idea of itself is not patentable.'" *Id.* (internal quotation marks omitted) (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). "The Supreme Court has not established a definitive rule to determine what constitutes an 'abstract idea' sufficient to satisfy the first step of the *Mayo/Alice* inquiry." *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016). The Supreme Court has recognized, however, that "fundamental economic practice[s]," *Bilski*, 561 U.S. at 611, "method[s] of organizing human activity," *Alice*, 134 S. Ct. at 2356, and mathematical algorithms, *Benson*, 409 U.S. at 64, are abstract ideas. In navigating the parameters of such categories, courts have generally sought to "compare claims at issue to those claims already found to be directed to an abstract idea in previous cases." *Enfish*, 822 F.3d at 1334. "But in determining whether the claims are directed to an abstract idea, we must be careful to avoid oversimplifying the claims because '[a]t some level, all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.'" *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016) (alterations in original) (quoting *Alice*, 134 S. Ct. at 2354).

Defendant argues that the '955 patent seeks "to cover the basic and well known business concept of providing a customer recommendation by gathering customer data from one

communication channel and providing a customer recommendation via another communication channel." (D.I. 18 at 13). Defendant contends that, like the concept of "intermediated settlement" in *Alice*, the '955 patent seeks to claim "'a building block of the modern economy.'" (*Id.* (quoting *Alice*, 134 S. Ct. at 2356)). Plaintiffs respond by repeatedly arguing that the '955 patent is directed to a computer-rooted, Internet-specific problem. (D.I. 23 at 16–18).

"Under step one of *Mayo/Alice*, the claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter." *Internet Patents*, 790 F.3d at 1346. Here, the claims are directed to the abstract idea of cross-channel customer service,[1] i.e., gathering customer information from one communication channel and using it to engage the customer via another communication channel. Indeed, cross-channel customer service is certainly "a fundamental economic practice long prevalent in our system of commerce," which more recently, with the proliferation of new communication channels such as social media, has become firmly established as "a building block of the modern economy." *Alice*, 134 S. Ct. at 2356. While claim 1 requires concrete, tangible components—such as "Internet-based programs or documents," "a web analyzer using a processor," and "modeled sessions"—much like in *TLI Commc'ns*, "the specification makes clear that the recited physical components merely provide a generic environment in which to carry out the abstract idea." *TLI Commc'ns*, 823 F.3d at 611. The specification repeatedly describes the problem presented and solved by the invention of the '955 patent as maintaining a consistent customer experience across different communications channels. ('955 patent, col. 1, ll. 36–41 ("Further variability may be introduced when customers use multiple different channels of communication, such as the Internet and call center for customer service. . . . [A]gents contacted via one channel may have

[1] "Customer service," as the '955 patent itself confirms, can include "provid[ing] technical support, sell[ing] products or schedul[ing] appointments." ('955 patent, col. 1, ll. 16–19).

no way to track a customer's history across another channel."); *id.* col. 4, ll. 43–45 ("Customer interactions may be tracked using 'cross-channel' analysis, e.g., across multiple channels of communication."); *id.* at 5:66–6:2 ("The real-time guidance message may offer up-sell or cross-sell options, for example, according to the analysis of the web interaction and business rules in a recommendations database.")). Courts have routinely found that similar claims are directed to abstract ideas. *See, e.g.*, *Elec. Power Grp., LLC v. Alstom S.A.*, -- F.3d --, 2016 WL 4073318, at *3 (Fed. Cir. Aug. 1, 2016) (claims directed to "collecting information, analyzing it, and displaying certain results of the collection and analysis" were abstract); *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1367 (Fed. Cir. 2015) (customizing web page content based on information known about the user, i.e., information tailoring, was an abstract idea); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015) (claims directed to "automat[ing] or otherwise mak[ing] more efficient traditional price-optimization methods" were abstract); *Content Extraction*, 776 F.3d at 1347 (claims directed to collecting, recognizing, and storing data were found abstract); *Pragmatus Telecom, LLC v. Genesys Telecommc'ns Labs., Inc.*, 114 F. Supp. 3d 192, 200 (D. Del. 2015) (claims were "directed to the abstract idea of communication between a customer and a business using a call center, automated and obfuscated along the way using certain computer, telephonic and network services").

Relying on *DDR Holdings, LLC v. Hotels.com*, 773 F.3d 1245 (Fed. Cir. 2014), Plaintiffs contend that "the '955 patent provides a concrete, specific solution to a problem necessarily rooted in computer and internet technology," namely, "how to provide call center agents (who only have access to customer service systems) with useful information about users' Internet session information (which is not available in customer service systems)." (D.I. 23 at 16). Plaintiffs argue that the claims of the '955 patent "like those in *DDR*, recite a specific computer

manipulation to solve a problem specifically arising the in the realm of computers and the Internet." (*Id.* at 18). Plaintiffs misread *DDR Holdings*. There, the Federal Circuit stated that "identifying the precise nature of the abstract idea [was] not as straightforward as in *Alice*" or other cases. *Id.* Therefore, the court simply assumed that the patent-in-suit was directed to an abstract idea, and then proceeded to *Mayo/Alice* step two. *See id.* ("[U]nder any of these characterizations of the abstract idea, the '399 patent's claims satisfy *Mayo/Alice* step two.").

Stripped of its generic computer components and limitation to a particular technological environment, an analogy demonstrates how the claimed method is abstract. A customer walks into a car dealership and encounters a car salesman. The customer tells the car salesman what she is looking for, the salesman shows the customer various cars on the lot, and the customer expresses enthusiasm for specific cars or features throughout the encounter, which the salesman notes along with his other observations of the customer. The customer decides not to buy anything that day. Later that day, the salesman thinks back to past customers who shared similar personal characteristics, interests, and concerns with this particular customer and remembers that they all purchased the same make and model of car, the 2014 WonderCar SLE. The salesman creates a file for the particular customer and makes a note of this recommendation in the customer's file. Several days later, the customer calls the dealership to ask a few questions and reaches salesman B. During the conversation, Salesman B pulls the dealership's file for the customer and sees the note suggesting that a 2014 WonderCar SLE would be perfect for this customer. Salesman B proceeds to recommend that the customer swing by the dealership to look at a red 2014 WonderCar SLE. Aside from the use of automation via generic computer components to increase efficiency, the salesman has just practiced the claimed method.

Lastly, in *Enfish*, the Federal Circuit recently clarified that a relevant inquiry at *Alice* step one is "to ask whether the claims are directed to an improvement to computer functionality versus being directed to an abstract idea . . . ." *Enfish*, 822 F.3d at 1335. It explained that courts should seek to distinguish between claims that are "directed to an improvement in the functioning of a computer" versus "simply adding conventional computer components to well-known business practices." *Id.* at 1338. The Federal Circuit found that the claims at issue in *Enfish* were not directed to an abstract idea because the claims outlined a "specific asserted improvement in computer capabilities . . ., [rather than] a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool." *Id.* at 1336. The claims here do precisely the opposite of the claims in *Enfish*.

Plaintiffs' efforts to summarize the invention of the '955 patent highlight the fact that the '955 patent does not claim any "improvement in computer capabilities," but instead claims an "abstract idea for which computers are invoked merely as a tool." *Enfish*, 822 F.3d at 1336. More specifically, Plaintiffs essentially parrot the claim language, arguing that:

> [T]he invention of the '955 patent involves a system and multi-step computerized method, according to which [1] content is extracted from Internet server traffic according to predefined rules, [2] the extracted content is associated with one or more of a user's Internet interaction sessions, [3] the user's Internet interaction sessions are indexed, [4] one or more of the user's Internet interaction sessions are compared to one or more modeled sessions to generate a recommendation of one or more future sessions paths, and [5] the recommendation is provided on a screen to a contact center agent in real time, while the contact center agent is communicating with the user during a user-initiated telephone call. As described below, each one of the above stages or sub-systems is computerized, and cannot be performed by a person.

(D.I. 23 at 8). Plaintiffs' brief then goes on for four pages outlining the steps of the claims and filling in details from the specification. (*Id.* at 8–11). However, Plaintiffs do not once point to anything in the specification that could conceivably constitute an advance or improvement in

technology for performing this method. Instead, the portions of the specification Plaintiffs rely upon merely describe a series of generic computer components that perform the claimed method steps—"a data extractor or other web capture device," "an analysis server," "an interactions database, which may include an index server," "a web analyzer," and "modeled sessions." (*Id.* at 8–11). Accordingly, the specification does not evidence any improvement in computer technology itself, but "merely provide[s] a generic environment in which to carry out the abstract idea." *TLI*, 823 F.3d at 611.

I therefore conclude that the claims are directed to the abstract idea of cross-channel customer service.

B. *Mayo/Alice* Step Two: Inventive Concept

The determination that a patent is directed to an abstract idea "does not render the subject matter ineligible." *Internet Patents*, 790 F.3d at 1346. Having decided that the patent's claims are directed to an abstract idea, the Court must next "determine whether the claims do significantly more than simply describe the abstract method." *Ultramercial*, 772 F.3d at 715. Since "a known idea, or one that is routine and conventional, is not inventive in patent terms," this analysis "favors inquiries analogous to those undertaken for determination of patentable invention." *Internet Patents*, 790 F.3d at 1346. Indeed, the Federal Circuit has noted that the two stages of the *Alice* two-step inquiry "are plainly related" and "involve overlapping scrutiny of the content of the claims . . . ." *Elec. Power Grp.*, 2016 WL 4073318, *3. Furthermore, neither "[a] simple instruction to apply an abstract idea on a computer," nor "claiming the improved speed or efficiency inherent with applying the abstract idea on a computer" satisfies the requirement of an "inventive concept." *Intellectual Ventures*, 792 F.3d at 1367.

Defendant argues, "At *Alice* step two, the asserted claims add nothing inventive—they just direct practitioners to implement the abstract idea using conventional computer components performing generic computer functions." (D.I. 27 at 7). Thus, according to Defendant, the '955 patent is merely "directed to speeding up an age-old customer service process through the use of computers—and not a scientific or technological advancement." (D.I. 18 at 16). Focusing on the fact that the claims are directed to extracting content from a user's Internet sessions, Plaintiffs argue that the '955 patent's claims contain an inventive concept because they are limited to a specific technological solution such that they would not preempt every manner of making cross-channel recommendations to customers. (D.I. 23 at 20). After repeating the language of claim 1, Plaintiffs continue to argue that the claims describe a "complex, computer-tethered process" because, for example, "extracting content from Internet server traffic is a complex task necessarily rooted in computer and Internet technology" and "a web analyzer is an Internet-specific software module." (D.I. 23 at 20–21). Moreover, Plaintiffs argue that the claimed "modeled sessions" provide an inventive concept because they are part of a "computer-specific process that reviews customer history and ideal session history to generate in real time a recommendation." (*Id.* 23). Plaintiffs emphasize, "This is not human-performable, as these are complex mathematical models based on an enormous amount of data." (*Id.*). Lastly, Plaintiffs contend that *DDR Holdings* is controlling because the '955 patent provides a solution tethered to the technology that created the problem.

I conclude that the independent claims of the '955 patent (1, 12, and 29) do not add any inventive concept to the abstract idea of cross-channel customer service. First, Plaintiffs' arguments—focusing on the fact that the claims require automatic, real-time analysis—confirm that the claims are merely directed to using generic computer components to add efficiency and

speed to the abstract idea of cross-channel customer service. However, it is well-settled that claims simply directed toward performing the abstract idea using generic computer components, such as a processor, do not contain an inventive concept. *See, e.g.*, *Elec. Power Grp.*, 2016 WL 4073318, at *5 ("Nothing in the claims, understood in light of the specification, requires anything other than off-the-shelf, conventional computer, network, and display technology . . . . We have repeatedly held that such invocations of computers and networks that are not even arguably inventive are insufficient to pass the test of an inventive concept in the application of an abstract idea." (internal quotation marks omitted)); *Intellectual Ventures*, 792 F.3d at 1371 ("Steps that do nothing more than spell out what it means to 'apply it on a computer' cannot confer patent-eligibility."); *Content Extraction*, 776 F.3d at 1347–48 ("For the role of a computer in a computer-implemented invention to be deemed meaningful in the context of this analysis, it must involve more than performance of 'well-understood, routine, [and] conventional activities previously known to the industry.'" (alteration in original) (quoting *Alice*, 134 S. Ct. at 2359)).

For example, the claims describe a "web analyzer using a processor" that can automatically compare one or more of the user's Internet interaction sessions to one or more "modeled sessions" to generate a recommendation. ('955 patent, claims 1, 12, 29). This claim language simply describes using a generic processor to speed up an analytical process. While the use of computer processors and real-time predictive analytics can certainly make analyzing information faster and more efficient, courts have repeatedly held that merely using a computer to increase the efficiency of a fundamental business practice is insufficient to transform the abstract idea into an inventive application. *See, e.g.*, *Intellectual Ventures*, 792 F.3d at 1370 ("[O]ur precedent is clear that merely adding computer functionality to increase the speed or efficiency of the process does not confer patent eligibility on an otherwise abstract idea.");

MySpace, Inc. v. GraphOn Corp., 672 F.3d 1250, 1267 (Fed. Cir. 2012) ("While running a particular process on a computer undeniably improves efficiency and accuracy, cloaking an otherwise abstract idea in the guise of a computer-implemented claim is insufficient to bring it within section 101.").

Second, unlike in *DDR Holdings*, the problem the '955 patent purportedly addresses is not itself inherently limited to the specific technological environment claimed by the patentee, as Plaintiffs suggest. The communications channels generally implicated by cross-channel customer service and marketing are not so limited. Indeed, as the amounts of different customer service channels have increased with new technology, cross-channel customer service could implicate a number of different channels through which businesses communicate with customers. For instance, one could replace the Internet interaction sessions and call center claimed by the patent with a company's mobile application and a customer support representative communicating with the consumer via text message.[2] Likewise, the challenges of cross-channel customer service can arise between brick-and-mortar stores and a company's national, centralized call center. Regardless of which two customer service channels are selected, the abstract idea is the same, cross channel customer service, i.e., providing customers with an integrated customer service experience across different communications channels.

Moreover, Plaintiffs' repeated incantations of "rooted in computer technology," "Internet-specific," and the like do not make this case similar to *DDR*, nor can they save claims directed to an abstract idea. In *DDR Holdings*, the claims at issue addressed "the problem of retaining website visitors that, if adhering to the routine, conventional functional of Internet hyperlink protocol, would be instantly transported away from a host's website after 'clicking' on

[2] I acknowledge that Plaintiffs may argue that the patent's claims are broad enough to encompass these alternative channels. I think this raises a considerable concern that the '955 patent would preempt the field, as I discuss below.

an advertisement and activating a hyperlink." *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014). Thus, the Federal Circuit emphasized that, unlike other cases where it invalidated patents under § 101, "these claims [stood] apart because they [did] not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet." *Id.* Unlike *DDR*, the challenges of maintaining a consistent, integrated customer service platform have existed as long as businesses have operated using multiple communications channels. While the proliferation of Internet and mobile technologies has no doubt provided new challenges for companies seeking to provide quality cross channel customer service, this does not render the problem addressed by the '955 patent an "Internet-specific" problem or one "rooted in computer technology." Moreover, it certainly does not give Plaintiffs a license to claim the abstract idea of engaging customers across multiple communications channels by simply limiting one of the claimed channels to being the Internet, especially where the Internet was a well-established medium in the world of commerce well before the patentee filed for the '955 patent in 2011.

Here, the limitation to a specific technological environment is not inherent in the problem faced in cross-channel customer service, but is provided in the claims by the patentee. More specifically, the patentee made the deliberate choice to limit the claimed data gathering to being from "Internet Server Traffic" and to limit the subsequent recommendation to occurring when the consumer initiates contact with the contact center agent. (*See, e.g.*, '955 patent, claim 1). Limiting the claims to these communication channels in this order—(1) gathering information from the Internet, then (2) communicating a recommendation via a contact center agent when the user initiates a call—does not provide an inventive concept to rescue an otherwise abstract idea. Indeed, the law is clear that a patentee cannot manufacture an inventive concept by claiming an

abstract idea but limiting it to a specific technological environment. *See, e.g.*, *Alice*, 134 S. Ct. at 2358 ("[T]he prohibition against patenting abstract ideas cannot be circumvented by attempting to limit the use of [the idea] to a particular technological environment." (quoting *Bilski*, 561 U.S. at 610–11); *Intellectual Ventures*, 792 F.3d at 1366 ("An abstract idea does not become nonabstract by limiting the invention to a particular field of use or technological environment, such as the Internet."); *Elec. Power Grp.*, 2016 WL 4073318, at *4. Here, that is all that the '955 patent does. It takes the abstract idea of cross-channel customer service, and limits it to a specific context that is not all that limiting, where the customer browses the Internet and subsequently calls a business's contact center.

Moreover, despite this purported limitation by the patentee, the broad claim terms employed in the '955 patent raise a genuine concern that the claims of the patent would largely preempt the integrated sales and customer service approaches of most modern businesses. Language such as "Internet server traffic" and "internet interaction sessions" could broadly sweep in any form of Internet-connected activity. Another example of the considerable breadth of the claims is that the specification states that "calling" is not limited to a traditional telephone call, but essentially includes any user-initiated contact with the contact center agent. ('955 patent, col. 3, ll. 54–59 (stating that "calling" can include "using a traditional telephone or other device such as a VOIP telephone, cellular telephone, or other device, to speak with another person" and pointing out that "embodiments of the invention may allow for a user to contact an agent via other methods, such as on-line chat")). Accordingly, the '955 patent would essentially preempt an entire integrated customer service strategy, whenever a user uses any Internet-based platform and subsequently initiates contact with anything that can be described as contact center.

Third, the claims and specification of the '955 patent do not provide any technical explanations as to how any of the various computer components function or provide the desired efficiency, but instead resort to vague, functional descriptions of the components. For instance, the specification describes the "web analyzer" in terms of its basic functions, rather than anything significant about the technology itself, stating that it "may retrieve data from capture storage 414 and/or capture database 416 and may analyze the data, identify, filter, save or extract interesting elements, such as, products and products prices . . . ." ('955 patent, col. 4, ll. 52–56). The Federal Circuit has recently clarified that such functional, result-oriented claims are a hallmark of claims commonly found invalid under § 101. *See Elec. Power Grp.*, 2016 WL 4073318, at *6 ("Indeed, the essentially result-focused, functional character of claim language has been a frequent feature of claims held ineligible under § 101, especially in the area of using generic computer and network technology to carry out economic transactions."); *TLI Commc'ns*, 823 F.3d at 615 ("While these units purport to add additional functionality to the server, the specification limits its discussion of these components to abstract functional descriptions devoid of technical explanation as to how to implement the invention. . . . Such vague, functional descriptions of server components are insufficient to transform the abstract idea into a patent-eligible invention."). Accordingly, I find that the claims of the '955 patent are "so result-focused, so functional, as to effectively cover any solution to [the] identified problem." *Elec. Power Grp.*, 2016 WL 4073318, at *6.

Fourth, the "modeled sessions" do not add any sort of inventive concept to transform the claims so as to be patent-eligible. While the specification does not explicitly define "modeled sessions," it seems to suggest that they are "one or more corresponding ideal session histories or summaries for comparison, for example, to predict optimal future session paths to recommend to

the customer." ('955 patent, col. 5, ll. 10–13). At oral argument, Plaintiffs' counsel similarly described "modeled sessions" as "computer constructs that associate certain web interactions with particular outcomes," or model outcomes. (D.I. 30 at 13:3–4). Accepting Plaintiffs' characterization for purposes of this motion, the "modeled sessions" appear to represent no more than making a basic statistical inference, or prediction of future behavior based on available data. The specification provides no guidance as to how modeled sessions are generated or what data inputs they may be based on, instead describing a broad, vague concept. Generically claiming the comparison of data to models, without explaining how those models are created or how those comparisons work, certainly does not add an inventive concept to the claimed abstract idea.

Lastly, Plaintiffs made no specific arguments in their answering brief or at oral argument that any of the dependent claims offer an inventive concept over and above those of the independent claims. Indeed, Plaintiffs' counsel indicated at oral argument that claims 1 and 12 are representative. (D.I. 30 at 28–29). Defendant argues that the asserted dependent claims—claims 3–5, 8–11, 14, 17, 19–20, 25, and 27–28—do not provide a sufficient inventive concept to transform the abstract idea into a patent-eligible application of that idea. (D.I. 18 at 21). Specifically, Defendant argues:

> For example, Claims 3 and 25 add limitations related to gathering content about common webpage actions like the title of a webpage and product details viewed. Claims 4, 5, and 17 add limitations related to generating a summary of the user's past or current Internet sessions, which simply describe the user's sessions, products viewed, and prices offered. Claim 20 adds that the modeled sessions are generated by real-life sessions with users. Claim 27 adds displaying 'a key-value summary' of the content to the agent during the telephone call. Claim 28 adds the concept of letting a user determine the web elements to be extracted on a web page.

(D.I. 18 at 21). After reviewing these dependent claims, I find that Defendant's summary of these claims' minimal additional contributions is accurate. The dependent claims not explicitly addressed by Defendant, likewise add nothing even arguably inventive. ('955 patent, claim 9

(adding that "information analyzed in the user's Internet interaction sessions includes key words the user used for searching"); *id.* claim 11 (adding that recommendation "is provided to the contact center agent in real-time"); *id.* claims 22–24 (adding variations in the structure of the "modeled sessions," such as modeled sessions with a "fixed linear path of webpages to browse" or "a dynamic tree-structure of paths"). I thus conclude that none of the asserted dependent claims provides an inventive concept rendering the abstract idea patent-eligible.

I conclude that the asserted claims of the '955 patent are directed to an abstract idea and lack an inventive concept. The asserted claims of the '955 patent are therefore invalid. Plaintiffs have failed to state a claim upon which relief can be granted. In light of this decision, Defendant's Motion to Dismiss for Failure to State a Claim as to Induced Infringement (D.I. 20) will be dismissed as moot.

IV. CONCLUSION

For the reasons set forth above, the motion to dismiss for lack of patentable subject matter (D.I. 17) will be granted. An appropriate order will be entered.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

NICE SYSTEMS LTD. and NICE SYSTEMS, INC.

Plaintiffs,

v.

Civil Action No. 15-743-RGA

CLICKFOX, INC.,

Defendant.

ORDER

At Wilmington, this 15 day of September, 2016, consistent with the memorandum opinion issued this same day; **IT IS ORDERED** that:

1. Defendant Clickfox, Inc.'s Motion to Dismiss for Failure to State a Claim as to Patentable Subject Matter (D.I. 17) is **GRANTED**.
2. Defendant Clickfox, Inc.'s Motion to Dismiss for Failure to State a Claim as to Induced Infringement is **DISMISSED AS MOOT**.

Richard G Andrews
United States District Judge

US008976955B2

(12) **United States Patent**
Liberman Ben-Ami et al.

(10) **Patent No.: US 8,976,955 B2**
(45) **Date of Patent: Mar. 10, 2015**

(54) **SYSTEM AND METHOD FOR TRACKING WEB INTERACTIONS WITH REAL TIME ANALYTICS**

(75) Inventors: **Hadas Liberman Ben-Ami**, Kadima (IL); **Leon Portman**, Rishon Lezion (IL); **Yuval Marco**, Kadima (IL); **Yosef Golan**, Askhelon (IL); **Shlomi Haba**, Petah Tiqva (IL); **Iftach Smith**, Hod Hasharon (IL); **Yizhar Ronen**, Hod HaSharon (IL); **Yohay Etsion**, Tel Aviv (IL); **Igor Cher**, Rehovot (IL); **Naama Damty**, Zichron-Yackov (IL); **Assaf Frenkel**, Ramat HaSharon (IL); **Uzi Baruch**, Maale Adumim (IL)

(73) Assignee: **Nice-Systems Ltd.**, Ra'anana (IL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 173 days.

(21) Appl. No.: **13/305,279**

(22) Filed: **Nov. 28, 2011**

(65) **Prior Publication Data**

US 2013/0136253 A1 May 30, 2013

(51) **Int. Cl.**
H04M 3/00 (2006.01)
H04M 5/00 (2006.01)

(52) **U.S. Cl.**
USPC **379/265.09**; 379/265.01; 709/224

(58) **Field of Classification Search**
USPC 379/265.09, 242, 265.01; 709/224, 225; 706/60; 705/10
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,535,256 A 7/1996 Maloney et al.
6,346,952 B1 2/2002 Shtivelman
6,721,416 B1 4/2004 Farrell
6,741,697 B2 5/2004 Benson et al.
6,748,072 B1 6/2004 McGraw et al.
6,904,143 B1 6/2005 Peterson et al.
6,922,466 B1 7/2005 Peterson et al.
6,922,689 B2 7/2005 Shtivelman
6,959,078 B1 10/2005 Eilbacher et al.
6,970,554 B1 11/2005 Peterson et al.
6,981,040 B1 12/2005 Konig et al.
7,035,926 B1 * 4/2006 Cohen et al. 709/225
7,165,105 B2 1/2007 Reiner et al.
7,200,614 B2 4/2007 Reid et al.
7,246,078 B2 7/2007 Vincent
7,370,004 B1 5/2008 Patel et al.
7,616,756 B2 11/2009 Blackwood et al.
7,644,134 B2 1/2010 Cohen et al.
7,844,504 B1 11/2010 Flockhart et al.
7,853,800 B2 12/2010 Watson et al.
7,949,574 B2 5/2011 Patel et al.
7,958,234 B2 * 6/2011 Thomas et al. 709/224
7,962,551 B2 6/2011 Mukundan et al.
7,962,616 B2 6/2011 Kupferman et al.
8,271,332 B2 9/2012 Mesaros
8,326,694 B2 12/2012 Patel et al.

(Continued)

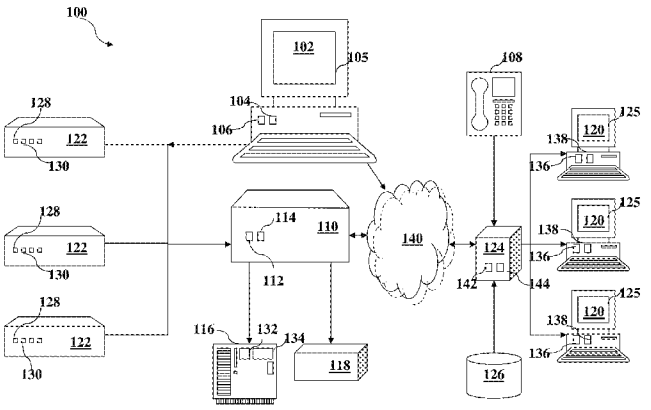
Primary Examiner — Thjuan K Addy

(74) *Attorney, Agent, or Firm* — Pearl Cohen Zedek Latzer Baratz LLP

(57) **ABSTRACT**

A device, system and method is provided for monitoring a user's interactions with Internet-based programs or documents. Content may be extracted from Internet server traffic according to predefined rules. Extracted content may be associated with a user's Internet interaction. The user's Internet interaction may be stored and indexed. The user's Internet interaction may be analyzed to generate a recommendation provided to a contact center agent while the contact center agent is communicating with said user for guiding the user's interaction, for example, in real-time. Traffic other than Internet server traffic may also be used.

29 Claims, 55 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

8,352,396	B2	1/2013	Forman et al.	
8,396,834	B2	3/2013	Bahadori et al.	
8,408,061	B2	4/2013	Thomas	
2002/0083167	A1*	6/2002	Costigan et al.	709/224
2002/0087385	A1*	7/2002	Vincent	705/10
2007/0208682	A1*	9/2007	Mancisidor et al.	706/60
2011/0184905	A1	7/2011	Phillips et al.	
2012/0195422	A1	8/2012	Famous	
2012/0303598	A1	11/2012	Newnham et al.	
2012/0303621	A1	11/2012	Newnham et al.	
2013/0024405	A1	1/2013	Newnham et al.	
2013/0080358	A1	3/2013	Newnham et al.	
2013/0080377	A1	3/2013	Newnham et al.	
2013/0110750	A1	5/2013	Newnham et al.	

* cited by examiner

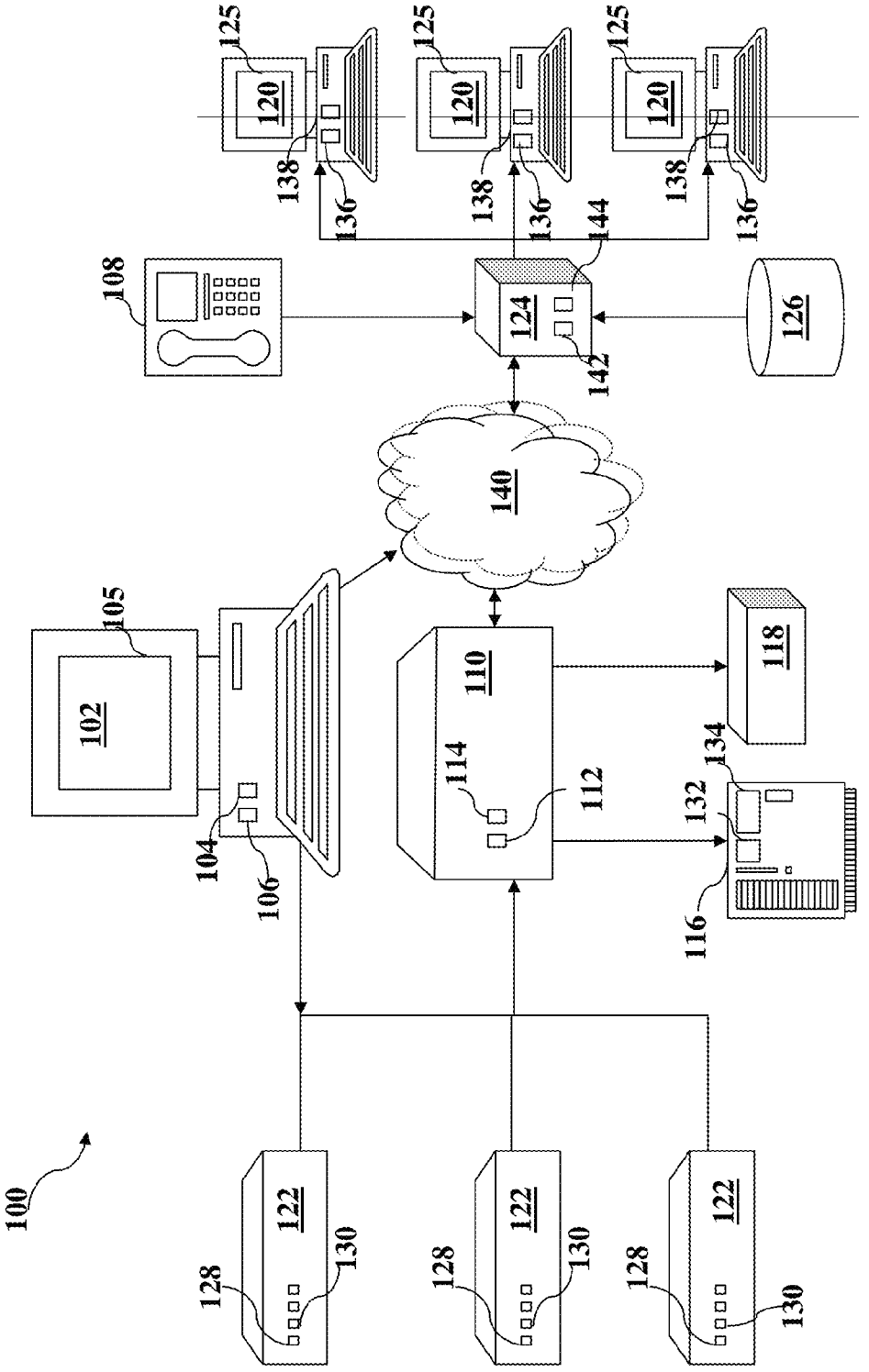

100
102
104
105
106
108
110
112
114
116
118
120
122
124
125
126
128
130
132
134
136
138
140
142
144

Fig. 1

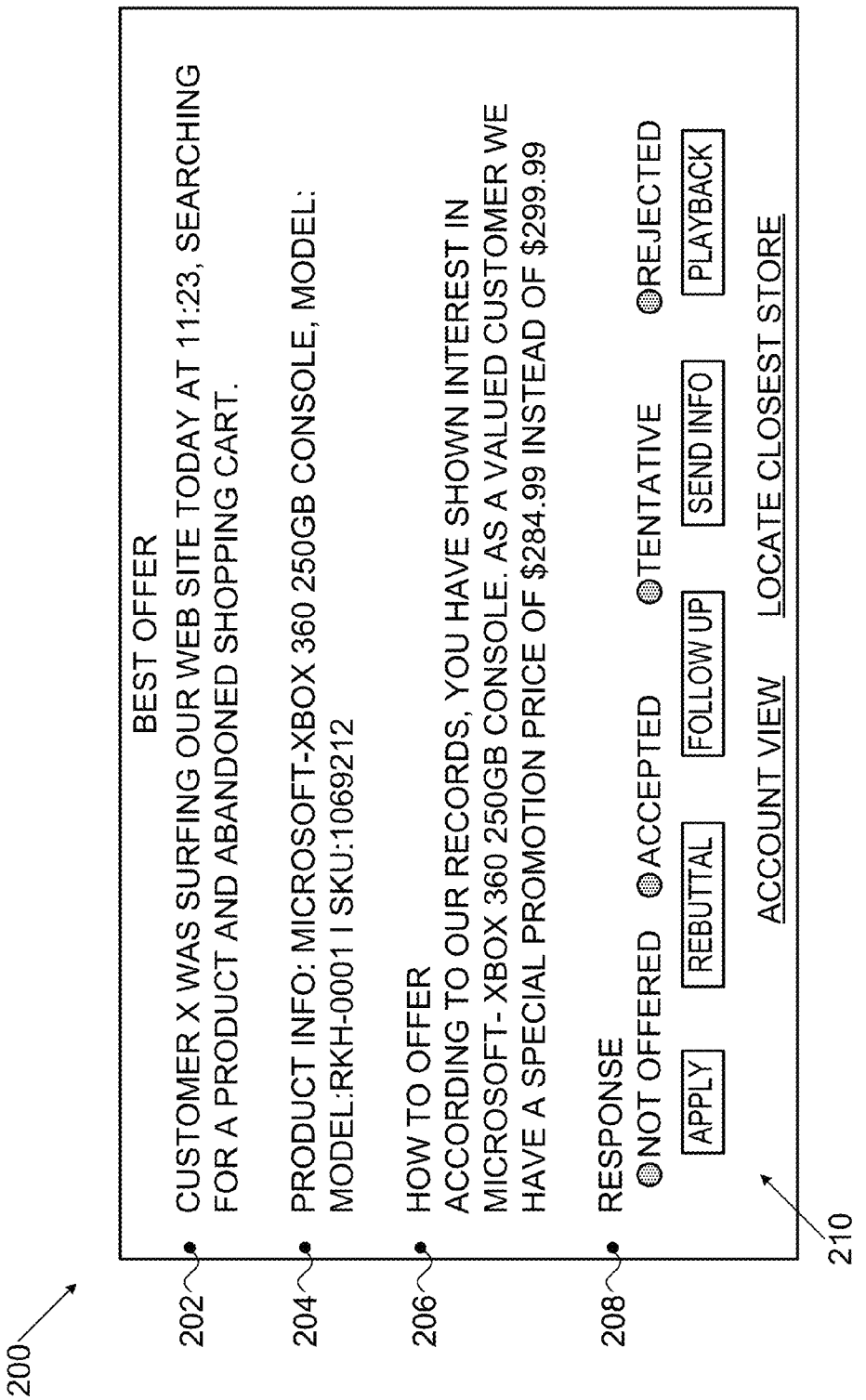

200
202
204
206
208
210
BEST OFFER
CUSTOMER X WAS SURFING OUR WEB SITE TODAY AT 11:23, SEARCHING FOR A PRODUCT AND ABANDONED SHOPPING CART.
PRODUCT INFO: MICROSOFT-XBOX 360 250GB CONSOLE, MODEL: MODEL:RKH-0001 I SKU:1069212
HOW TO OFFER
ACCORDING TO OUR RECORDS, YOU HAVE SHOWN INTEREST IN MICROSOFT- XBOX 360 250GB CONSOLE. AS A VALUED CUSTOMER WE HAVE A SPECIAL PROMOTION PRICE OF $284.99 INSTEAD OF $299.99
RESPONSE
NOT OFFERED
ACCEPTED
TENTATIVE
REJECTED
APPLY
REBUTTAL
FOLLOW UP
SEND INFO
PLAYBACK
ACCOUNT VIEW
LOCATE CLOSEST STORE

FIG. 2

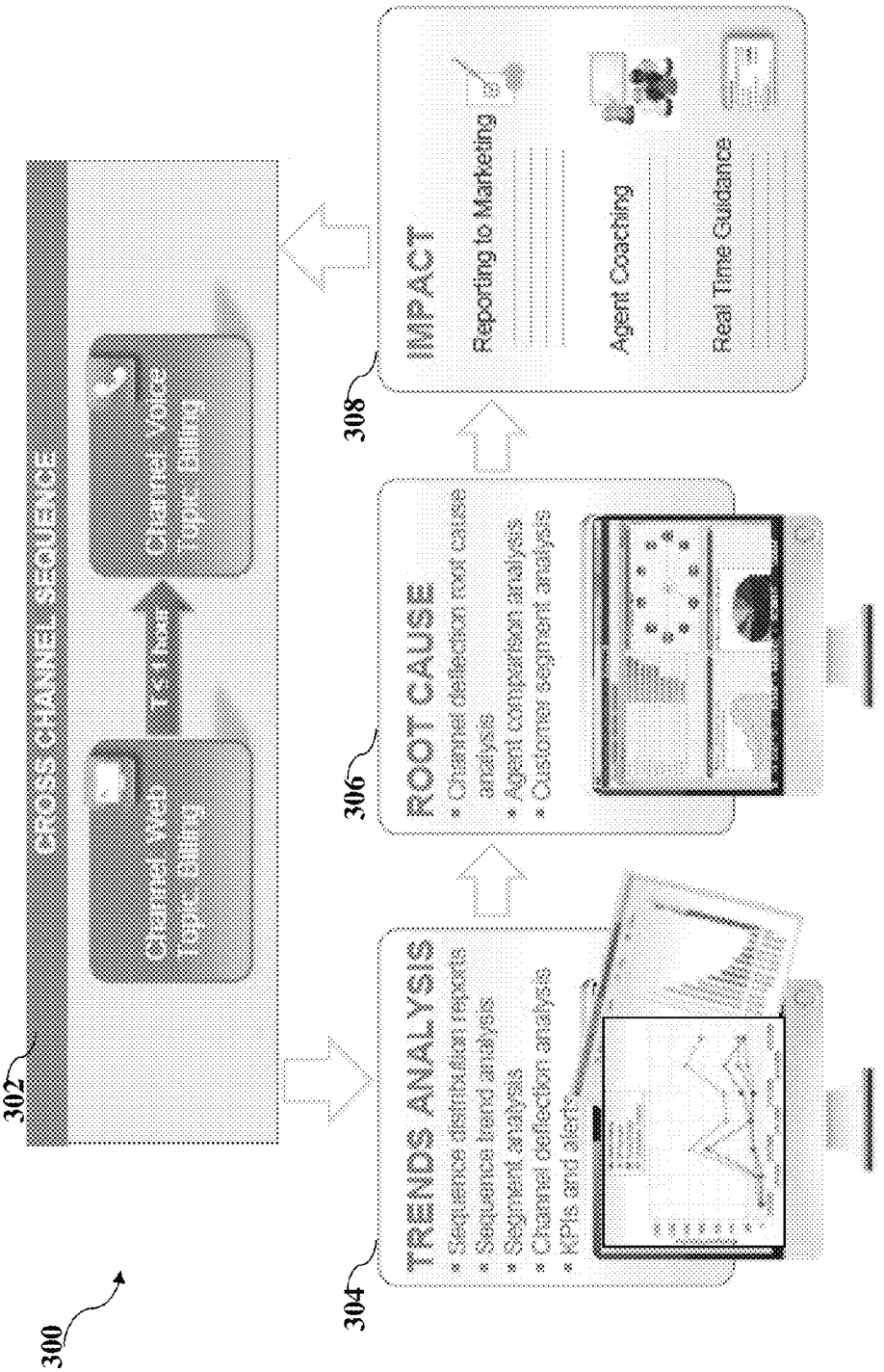

300
302
CROSS CHANNEL SEQUENCE
Channel Web Text Build
Channel Voice Text Build
304
TRENDS ANALYSIS
* Sequence distribution reports
* Sequence trend analysis
* Segment analysis
* Channel collection analysis
* KPIs and alerts
306
ROOT CAUSE
* Channel deflection root cause analysis
* Agent comparison analysis
* Customer segment analysis
308
IMPACT
Reporting to Marketing
Agent Coaching
Real Time Guidance

Fig. 3

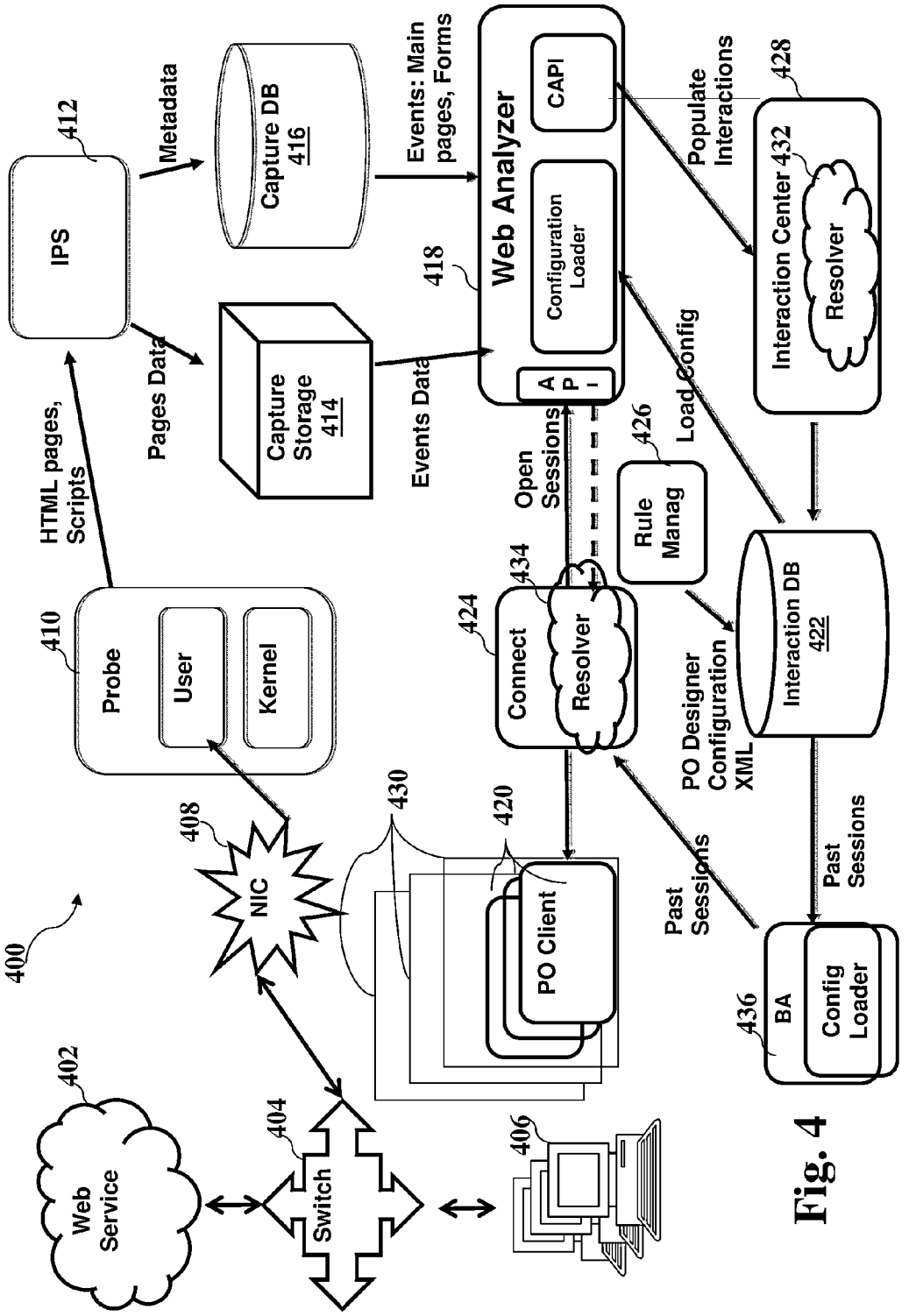

400
IPS
412
Metadata
Capture DB
416
Events: Main pages, Forms
Web Analyzer
418
CAPI
Configuration Loader
API
Populate Interactions
428
Interaction Center
432
Resolver
Pages Data
Capture Storage
414
Events Data
HTML pages, Scripts
Open Sessions
426
Load Config
Rule Manag
Probe
410
User
Kernel
Connect
424
Resolver
434
Interaction DB
422
PO Designer Configuration XML
NIC
408
430
420
PO Client
Past Sessions
Past Sessions
BA
436
Config Loader
Web Service
402
Switch
404
406

Fig. 4

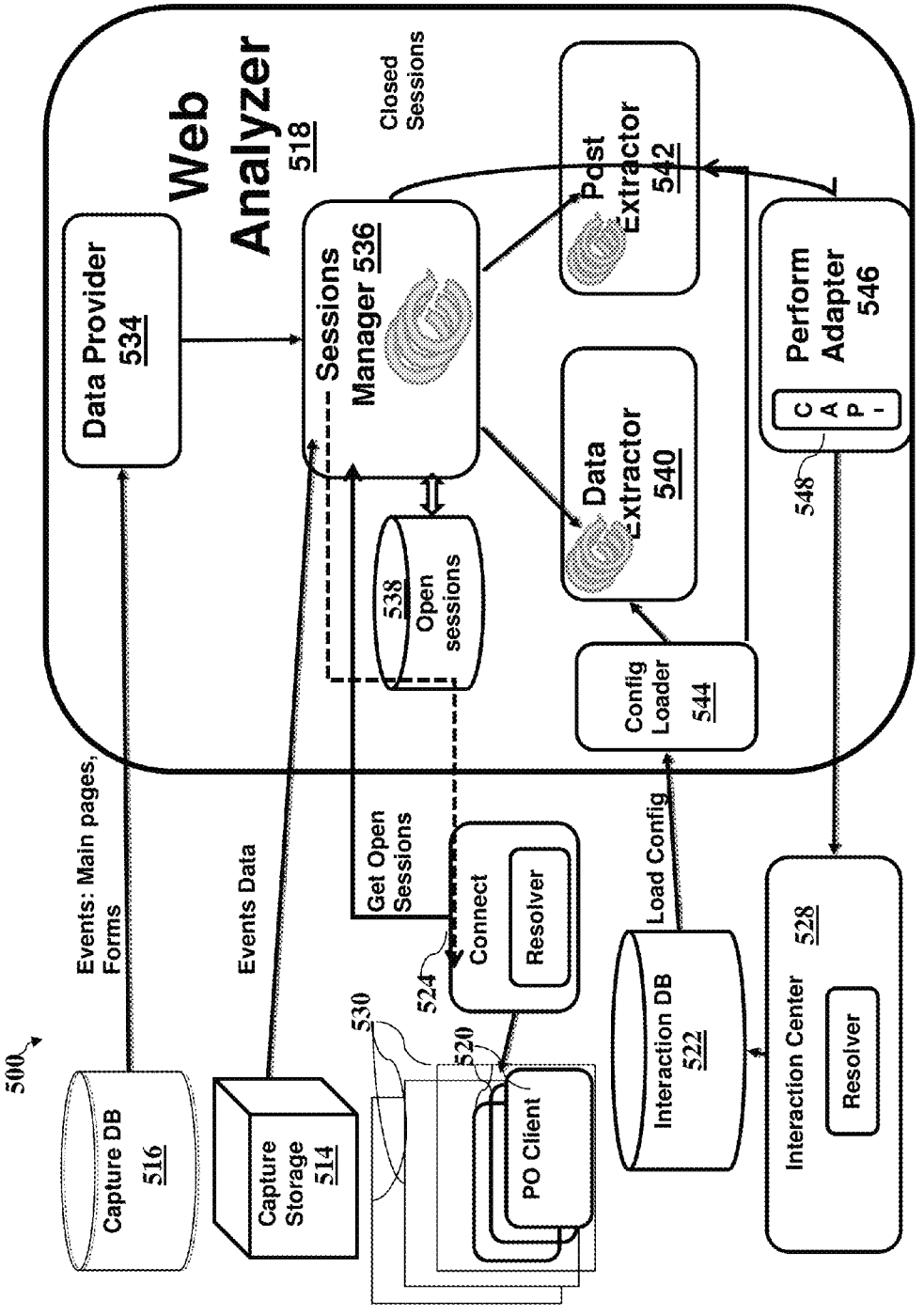

500
Web Analyzer 518
Data Provider 534
Sessions Manager 536
Closed Sessions
Past Extractor 542
Perform Adapter 546
C A P I
548
Data Extractor 540
538 Open sessions
Config Loader 544
Events: Main pages, Forms
Events Data
Get Open Sessions
Load Config
524
Connect
Resolver
530
520
PO Client
Capture DB 516
Capture Storage 514
Interaction DB 522
Interaction Center 528
Resolver

Fig. 5

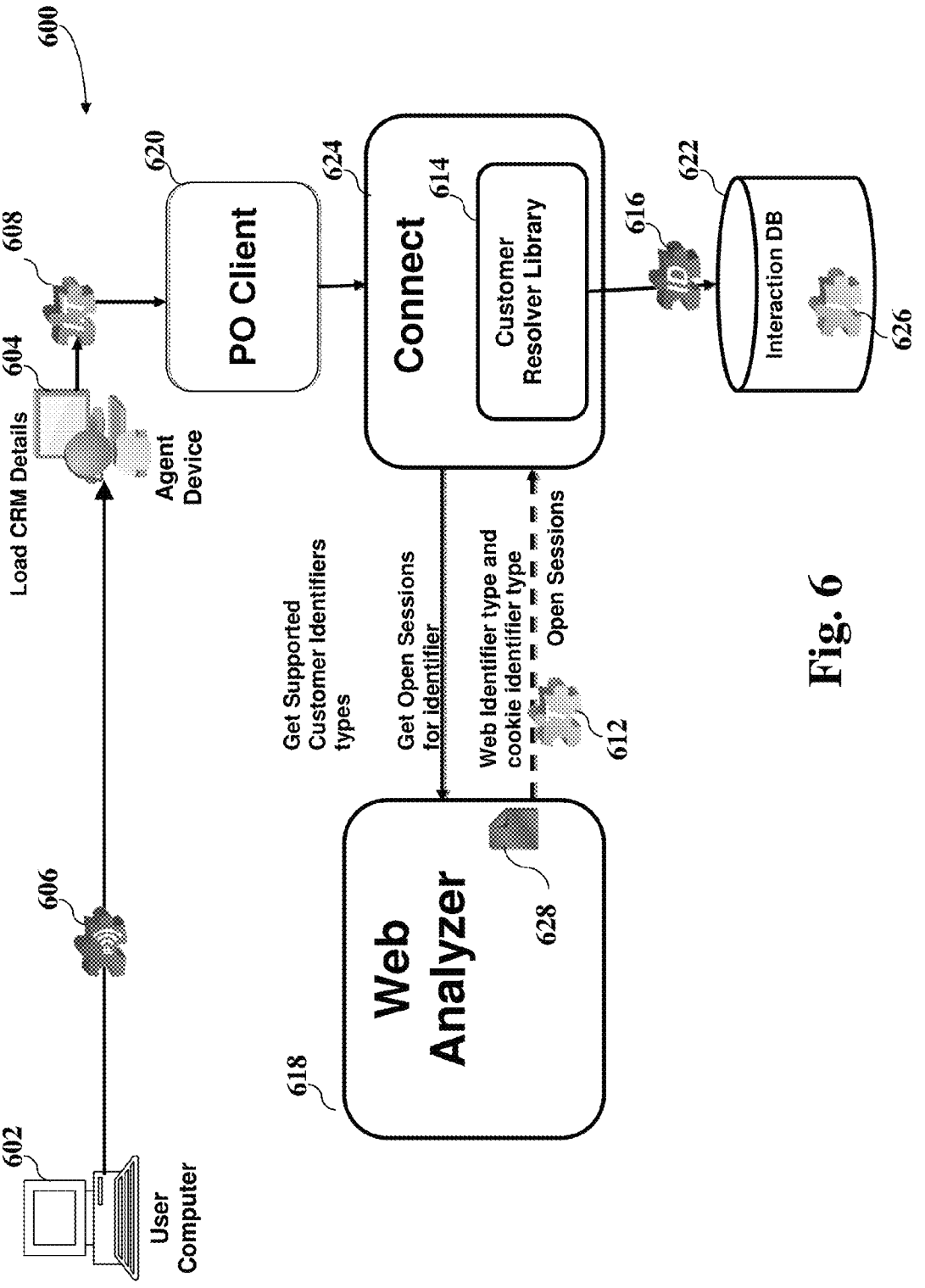

600
620
PO Client
624
Connect
614
Customer Resolver Library
622
Interaction DB
626
616
608
604
Load CRM Details
Agent Device
Get Supported Customer Identifiers types
Get Open Sessions for identifier
Web Identifier type and cookie identifier type
Open Sessions
612
606
Web Analyzer
628
618
602
User Computer

Fig. 6

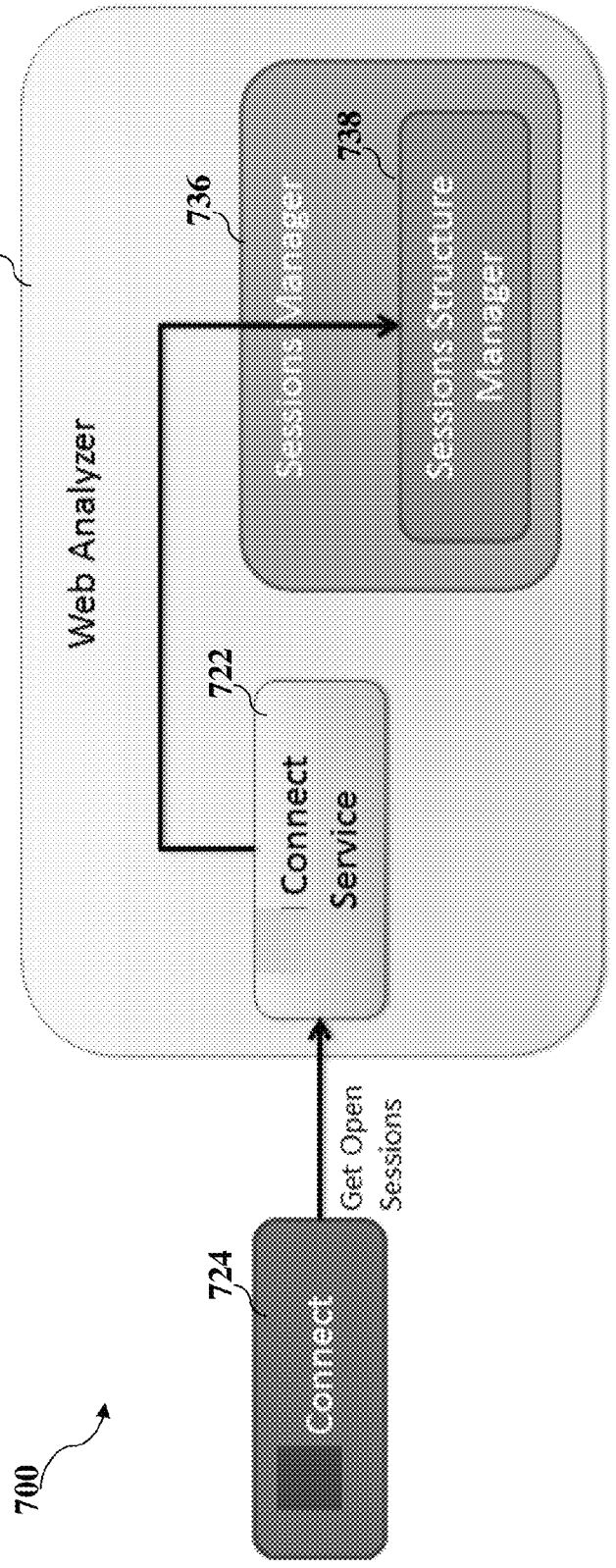

718
Web Analyzer
736
Sessions Manager
738
Sessions Structure Manager
722
Connect Service
Get Open Sessions
724
Connect
700

Fig. 7

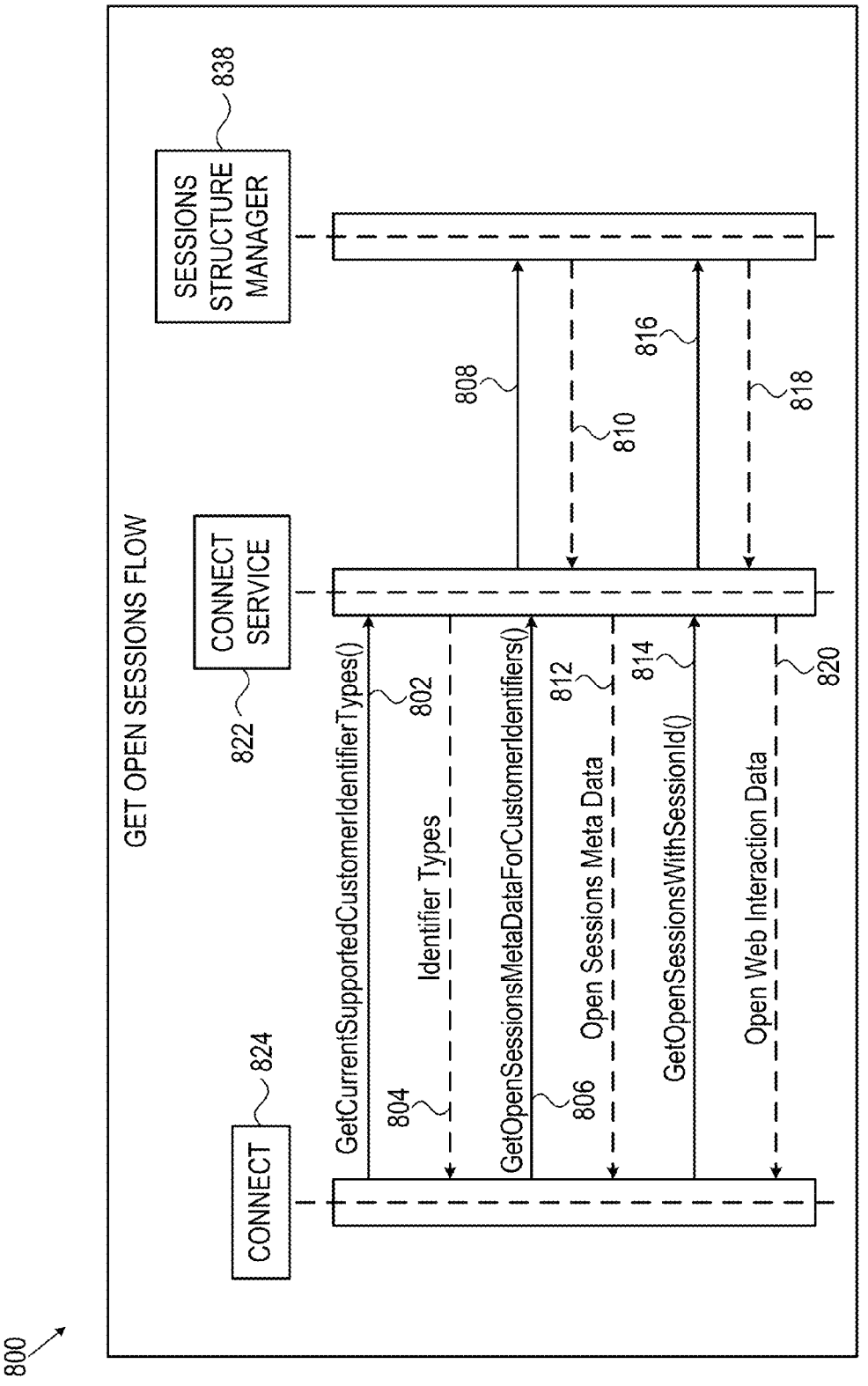

800
GET OPEN SESSIONS FLOW
CONNECT
824
CONNECT SERVICE
822
SESSIONS STRUCTURE MANAGER
838
GetCurrentSupportedCustomerIdentifierTypes()
802
Identifier Types
804
GetOpenSessionsMetaDataForCustomerIdentifiers()
806
Open Sessions Meta Data
812
GetOpenSessionsWithSessionId()
814
Open Web Interaction Data
820
808
810
816
818

FIG. 8

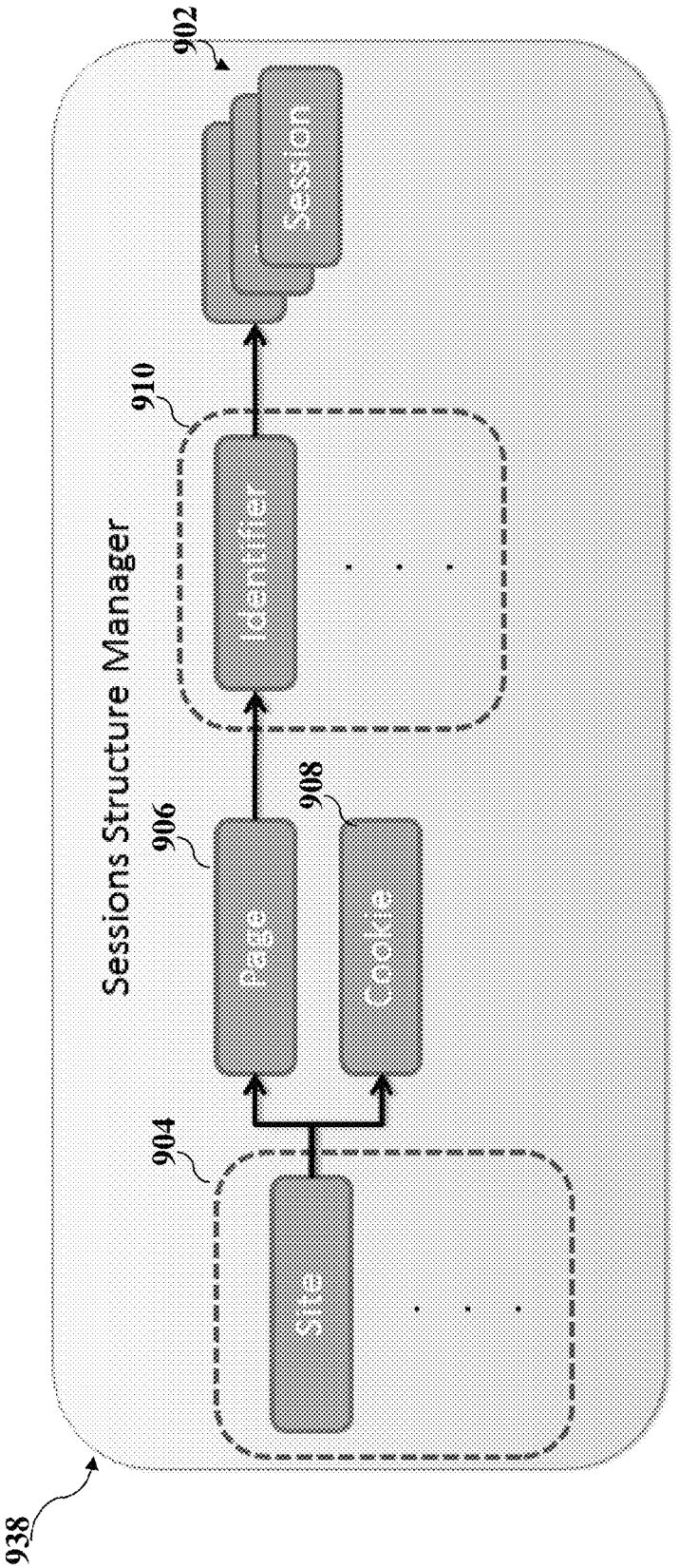

902
Session
910
Identifier
Sessions Structure Manager
906
Page
908
Cookie
904
Site
938

Fig. 9

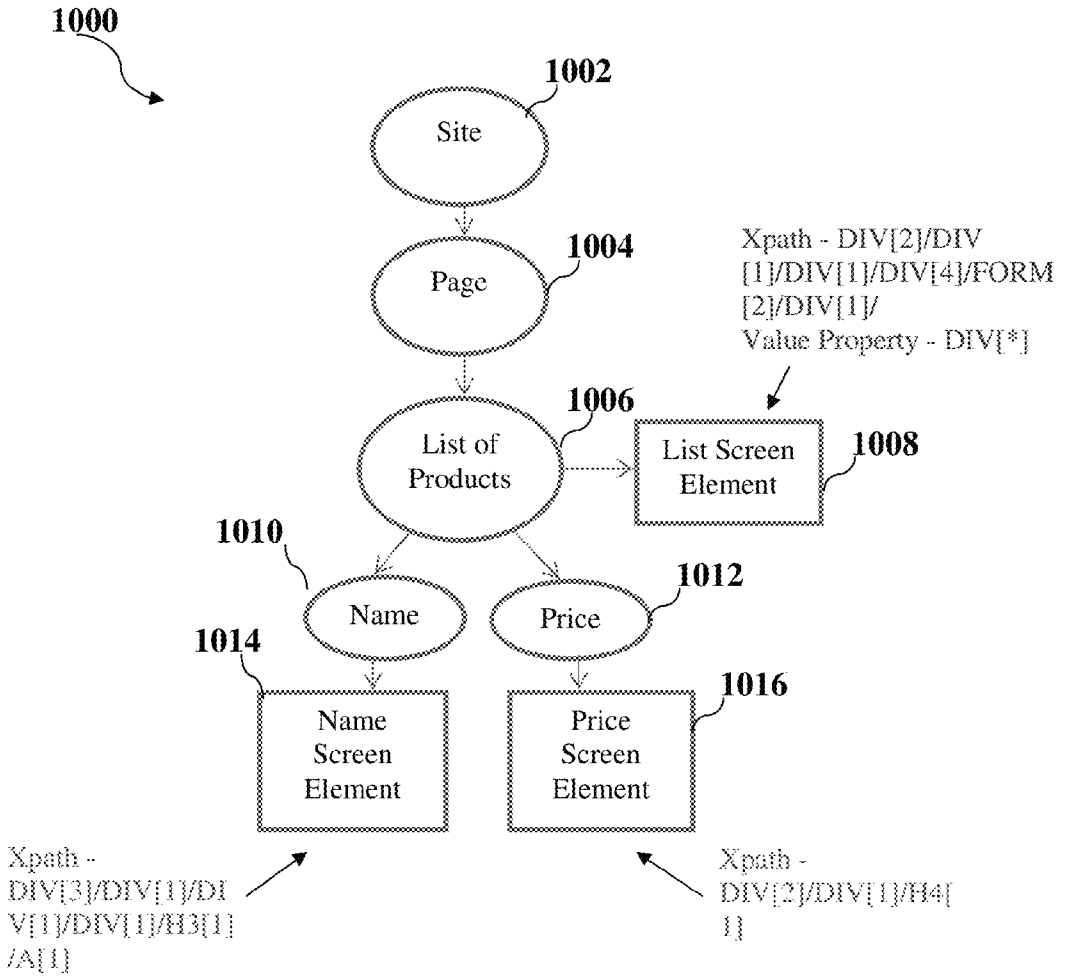

1000
1002
Site
1004
Page
Xpath - DIV[2]/DIV
[1]/DIV[1]/DIV[4]/FORM
[2]/DIV[1]/
Value Property - DIV[*]
1006
List of
Products
List Screen
Element
1008
1010
Name
1012
Price
1014
Name
Screen
Element
1016
Price
Screen
Element
Xpath -
DIV[3]/DIV[1]/DI
V[1]/DIV[1]/H3[1]
/A[1]
Xpath -
DIV[2]/DIV[1]/H4[
1]

Fig. 10

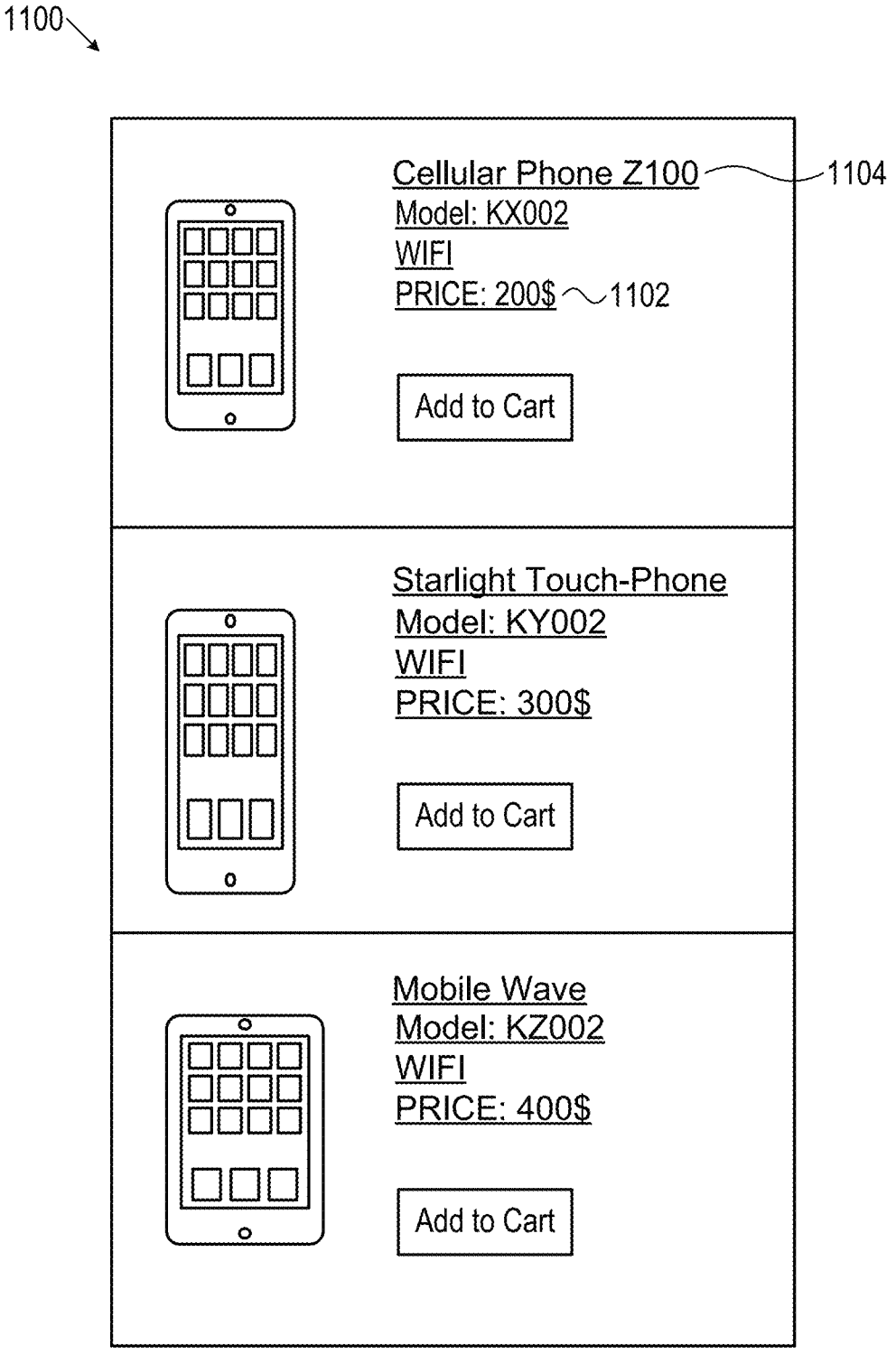

1100
Cellular Phone Z100
1104
Model: KX002
WIFI
PRICE: 200$
1102
Add to Cart
Starlight Touch-Phone
Model: KY002
WIFI
PRICE: 300$
Add to Cart
Mobile Wave
Model: KZ002
WIFI
PRICE: 400$
Add to Cart

FIG. 11

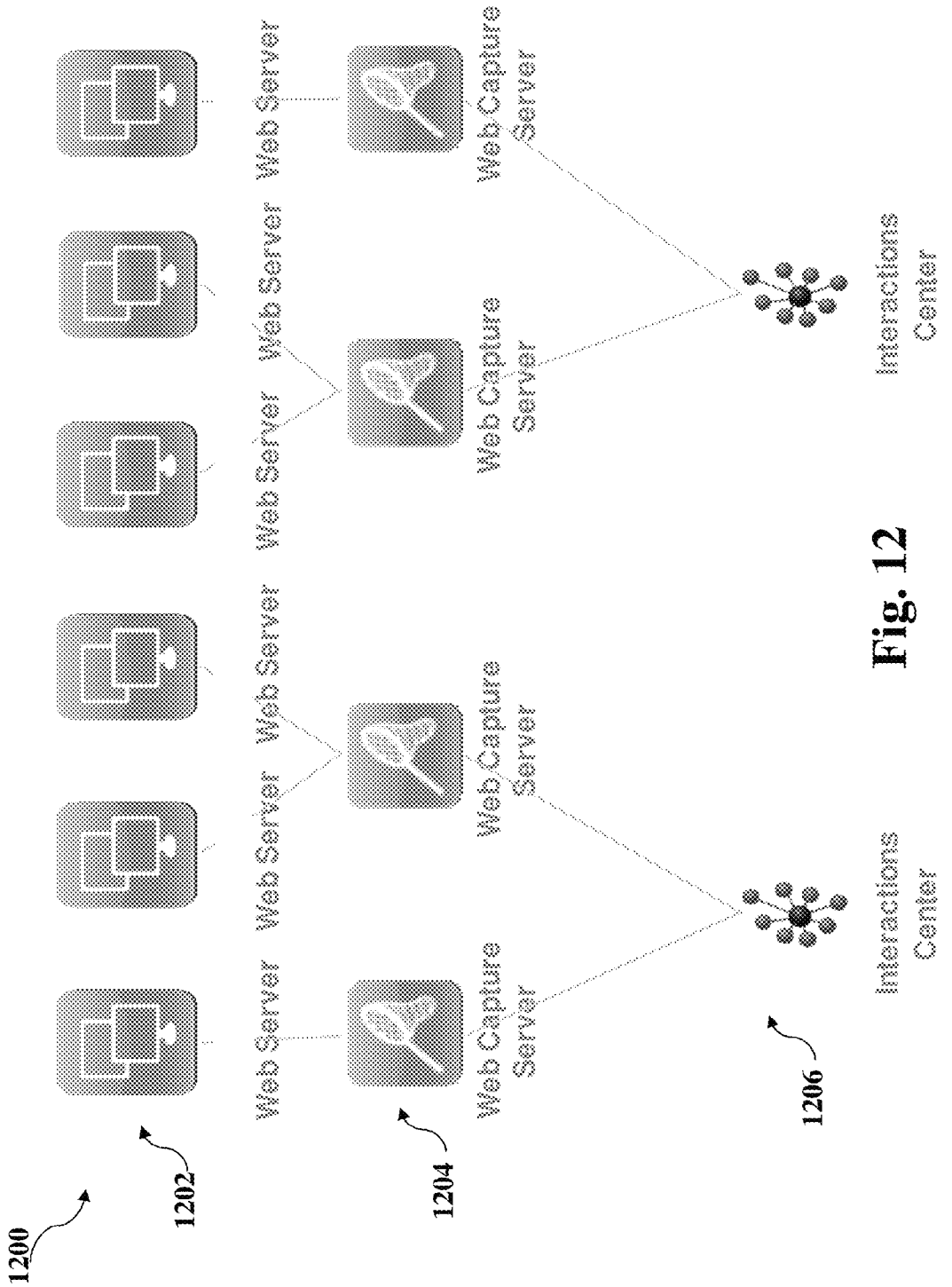

1200
1202
1204
1206
Web Server
Web Server
Web Server
Web Server
Web Server
Web Capture Server
Web Capture Server
Web Capture Server
Interactions Center
Interactions Center

Fig. 12

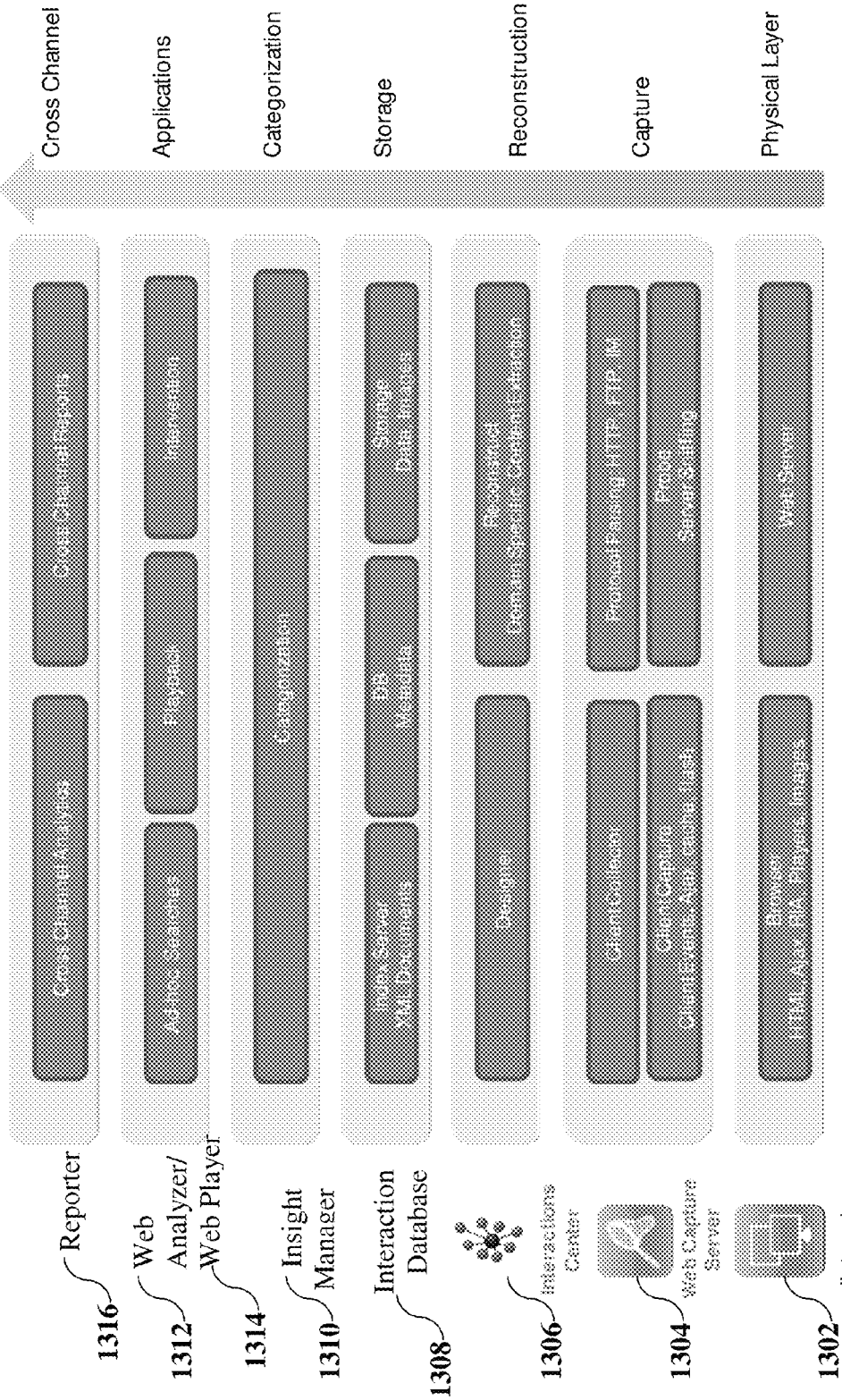

Cross Channel
Applications
Categorization
Storage
Reconstruction
Capture
Physical Layer
Reporter
Web Analyzer/ Web Player
Insight Manager
Interaction Database
Interactions Center
Web Capture Server
Enterprise Web Server
1316
1312
1314
1310
1308
1306
1304
1302

Fig. 13

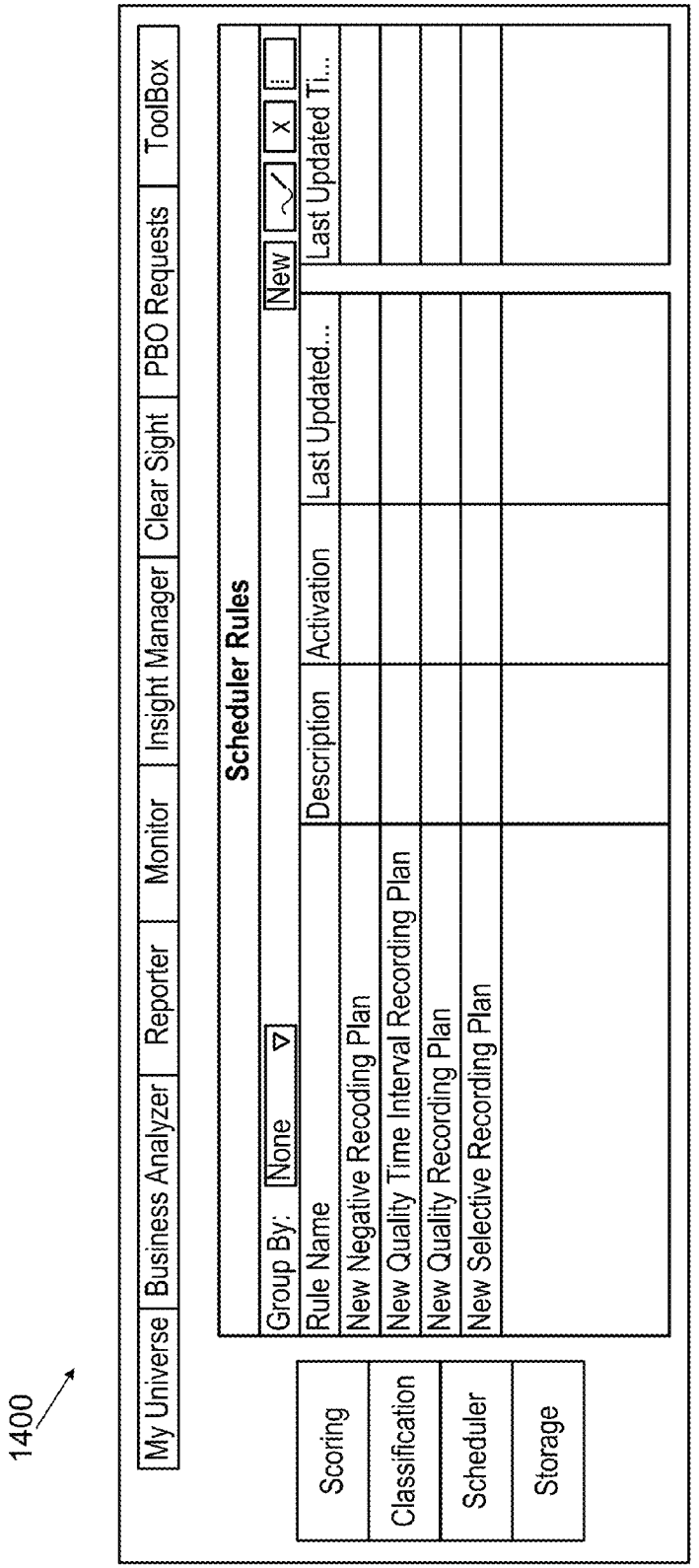

1400
My Universe
Business Analyzer
Reporter
Monitor
Insight Manager
Clear Sight
PBO Requests
ToolBox
Scoring
Classification
Scheduler
Storage
Scheduler Rules
Group By: None
New
X
Rule Name
Description
Activation
Last Updated...
Last Updated Ti...
New Negative Recoding Plan
New Quality Time Interval Recording Plan
New Quality Recording Plan
New Selective Recording Plan

FIG. 14A

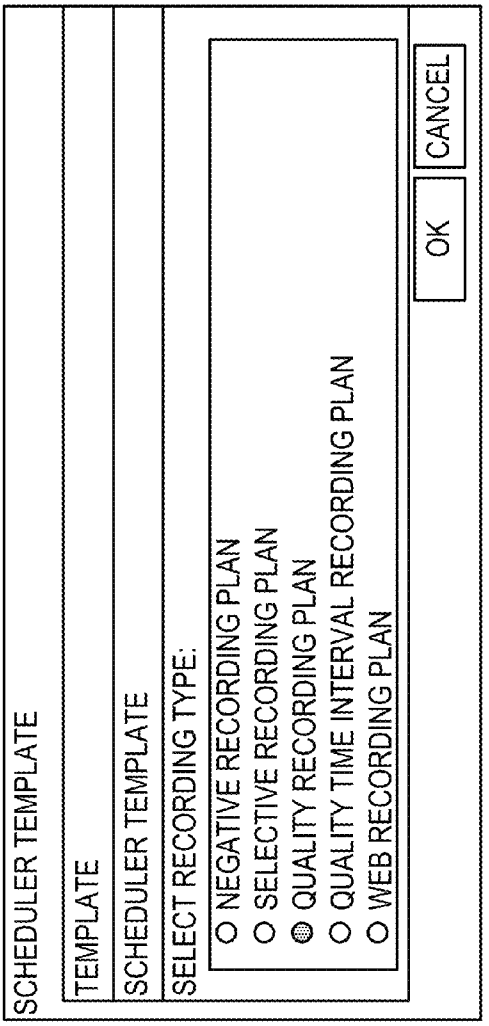


FIG. 14B

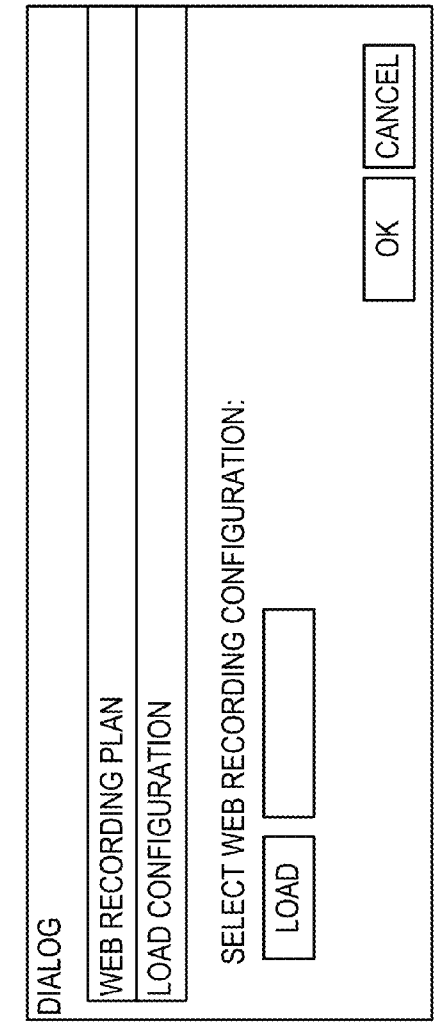


FIG. 14C

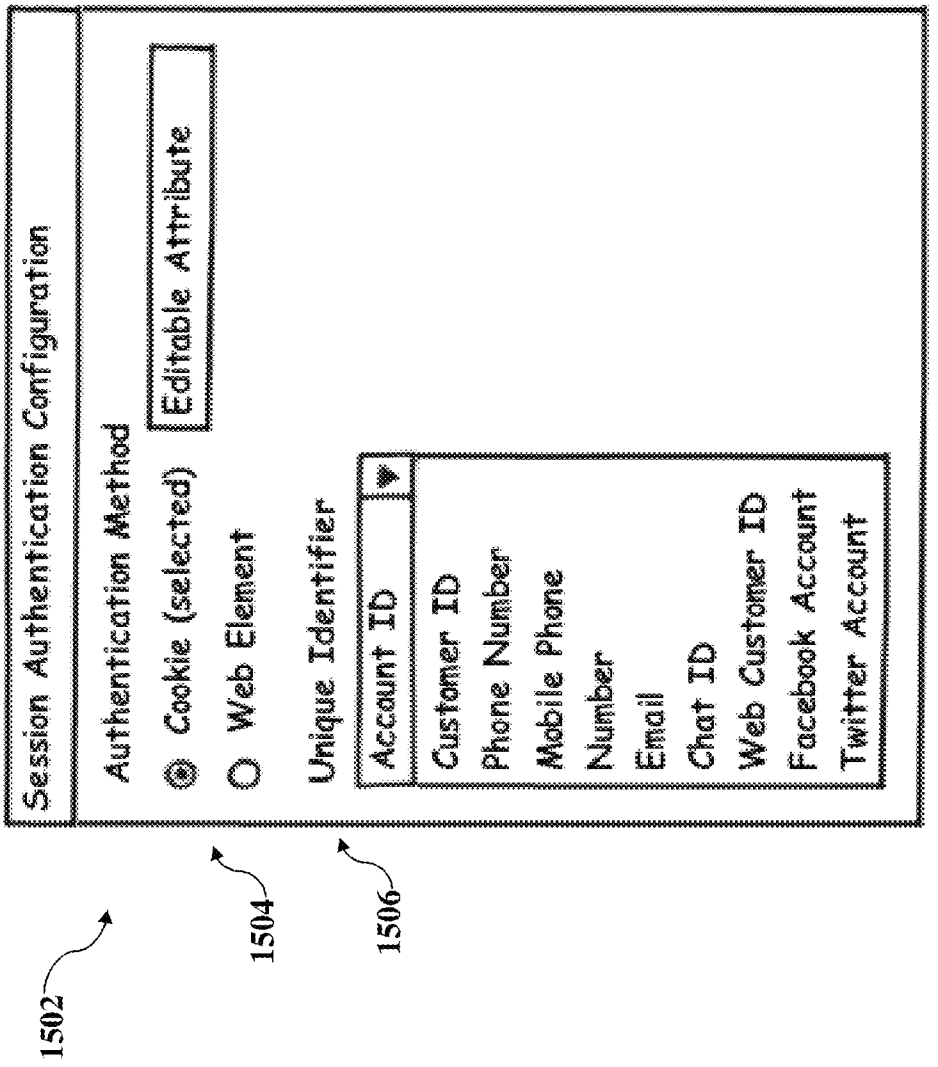

Session Authentication Configuration
Authentication Method
Cookie (selected)
Web Element
Editable Attribute
Unique Identifier
Account ID
Customer ID
Phone Number
Mobile Phone Number
Email
Chat ID
Web Customer ID
Facebook Account
Twitter Account
1502
1504
1506

Fig. 15

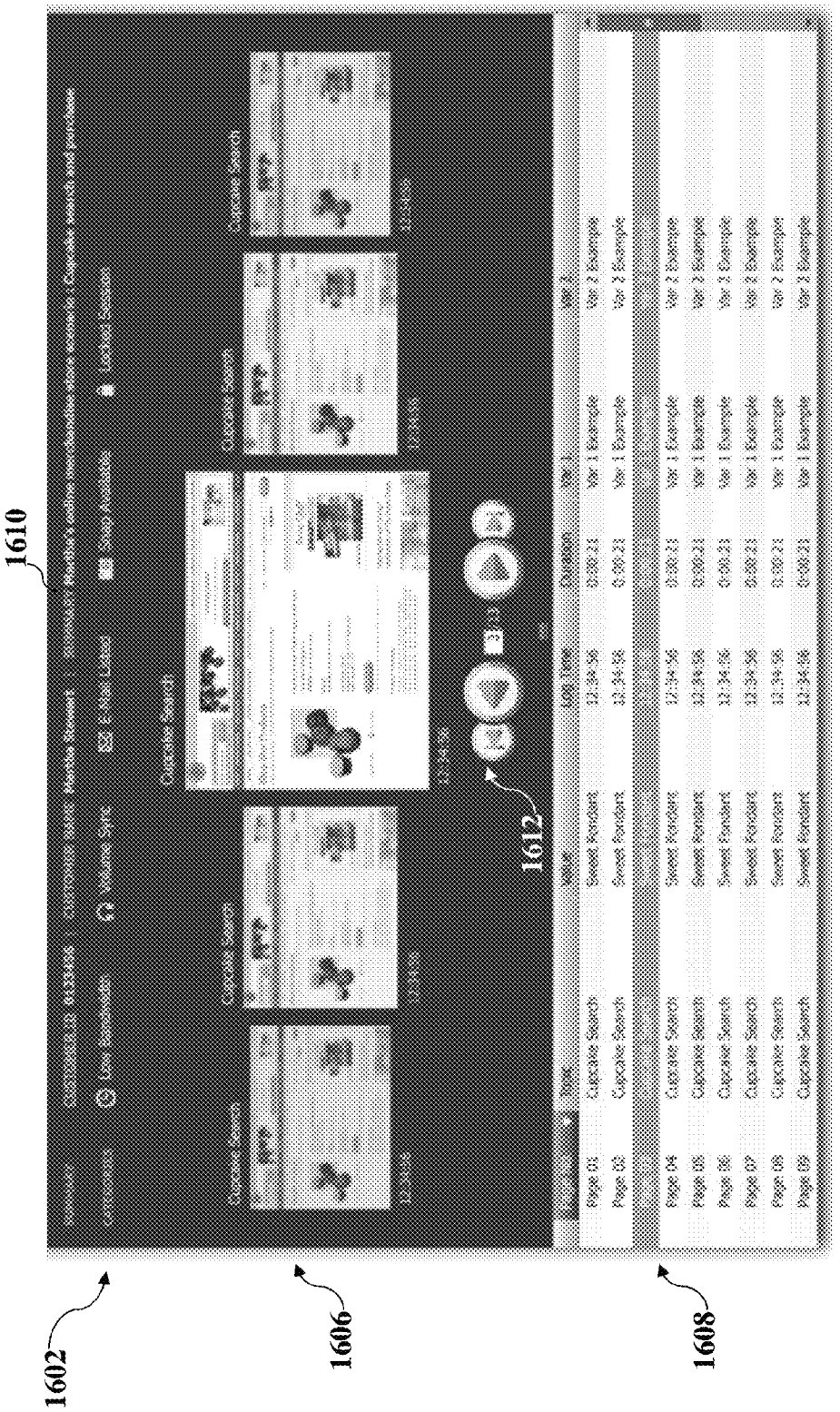


Fig. 16A

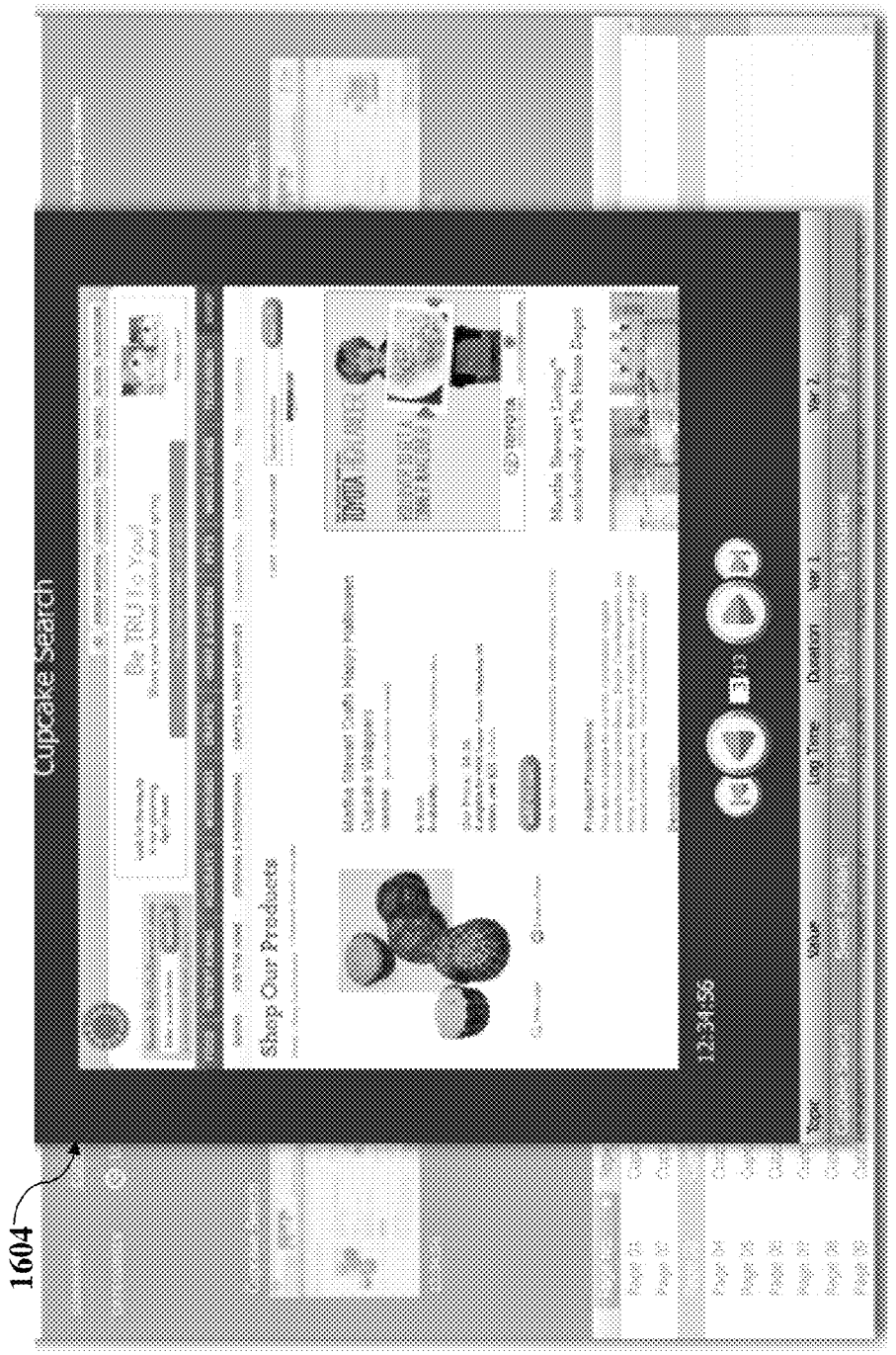


Fig. 16B

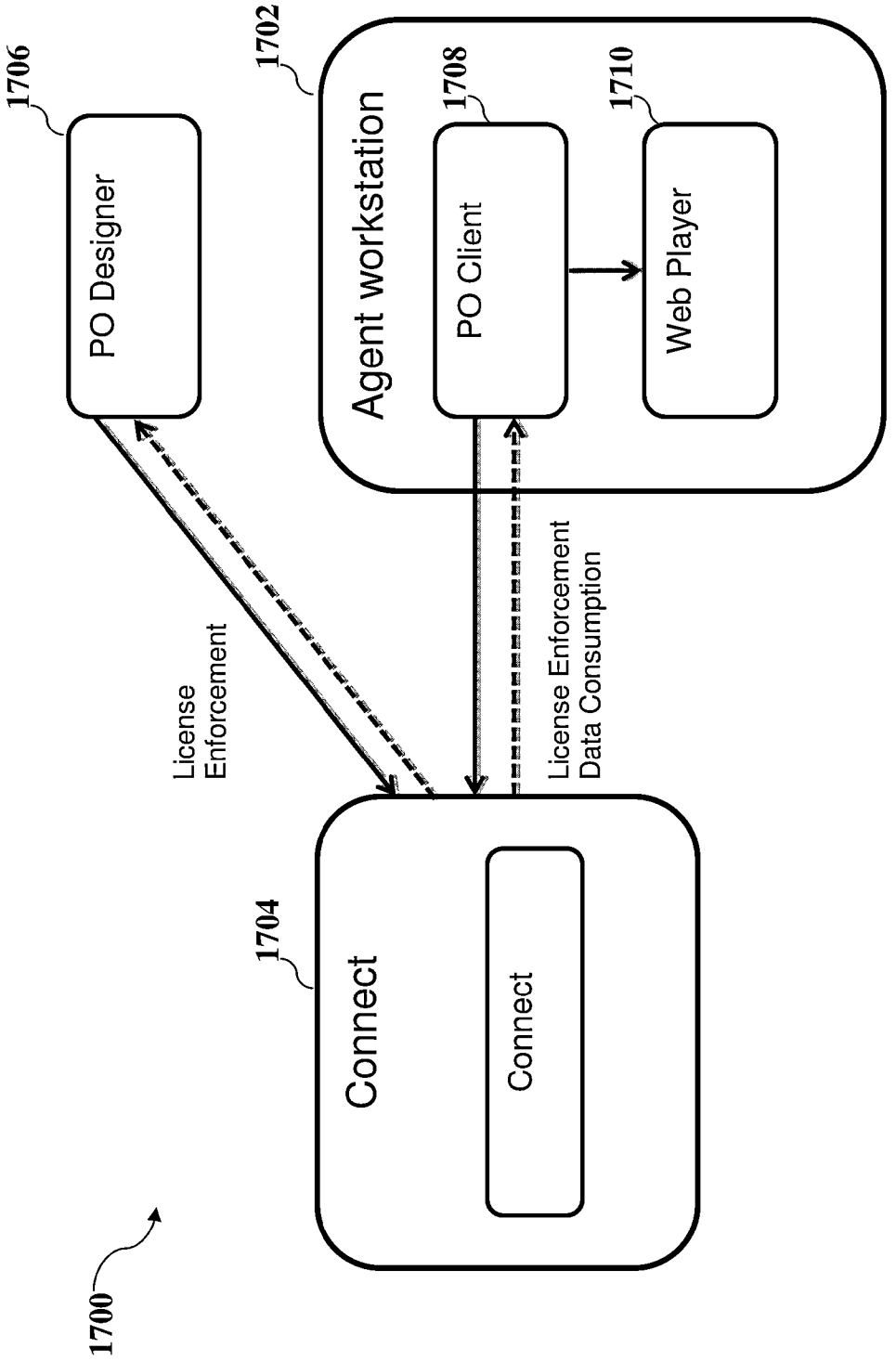

1706
PO Designer
1702
Agent workstation
1708
PO Client
1710
Web Player
License Enforcement
License Enforcement Data Consumption
1704
Connect
Connect
1700

Fig. 17

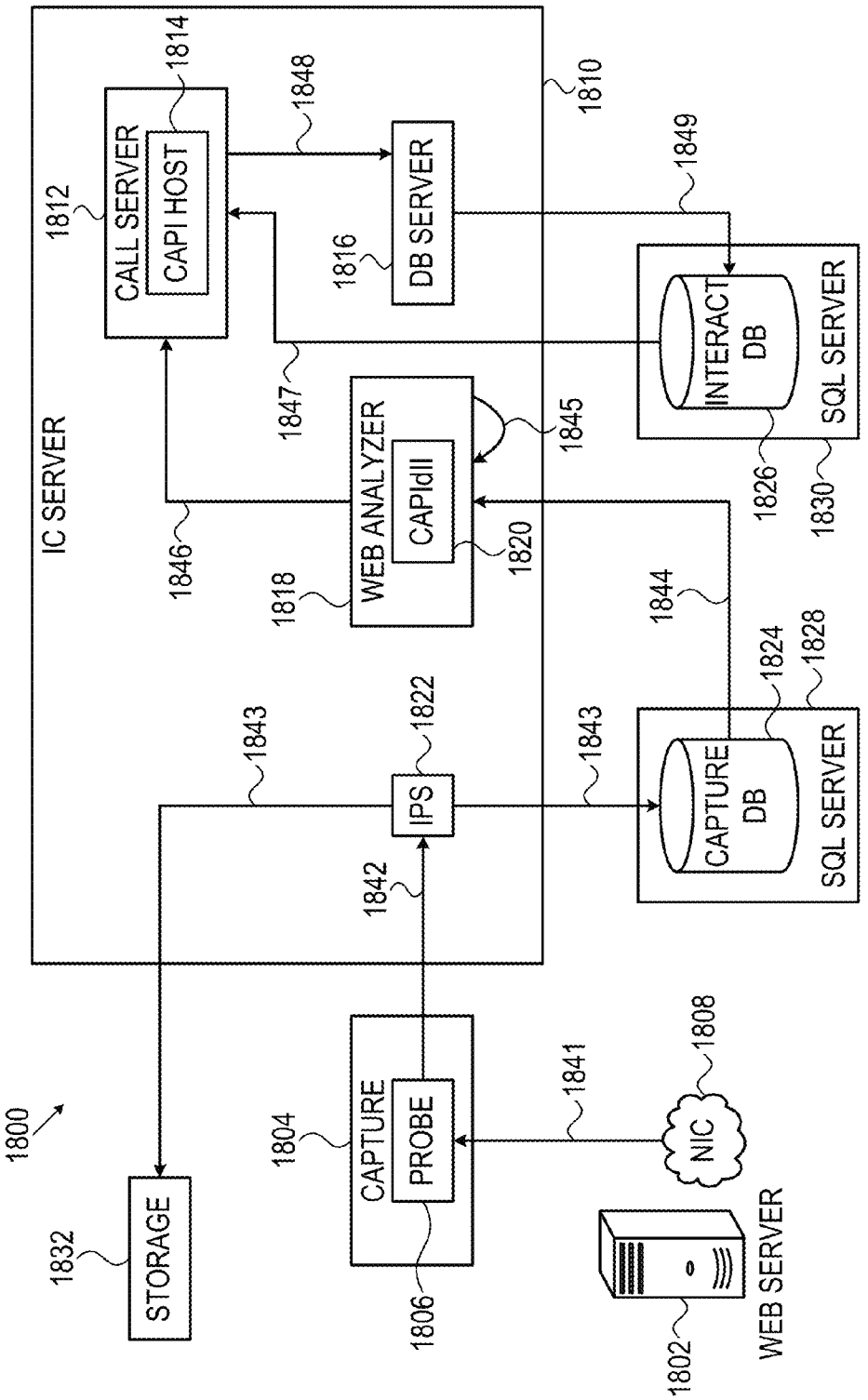

1800
IC SERVER
1810
CALL SERVER
CAPI HOST
1812
1814
DB SERVER
1816
1848
1849
INTERACT DB
SQL SERVER
1826
1830
1847
WEB ANALYZER
CAPIdll
1818
1820
1845
1846
1844
1824
1828
CAPTURE DB
SQL SERVER
1843
1822
IPS
1842
CAPTURE
PROBE
1804
1806
1841
NIC
1808
STORAGE
1832
WEB SERVER
1802

FIG. 18

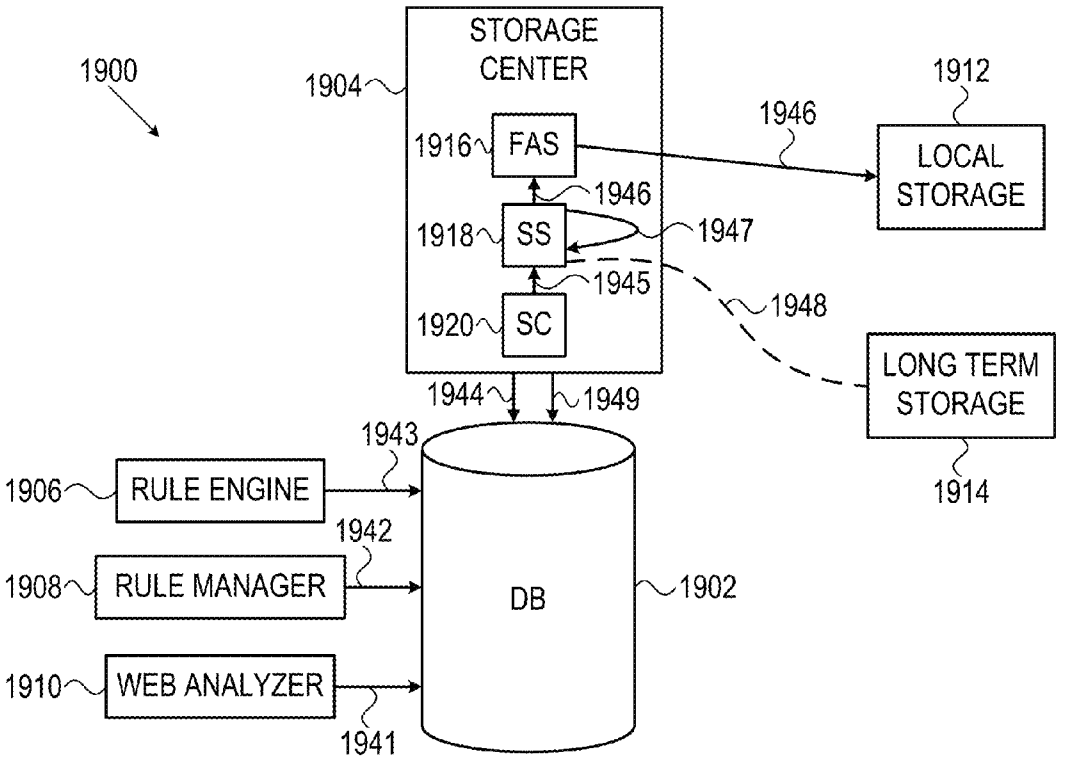

1900
STORAGE CENTER
1904
1916
FAS
1946
1912
LOCAL STORAGE
1946
1918
SS
1947
1945
1948
1920
SC
LONG TERM STORAGE
1944
1949
1943
1906
RULE ENGINE
1942
1908
RULE MANAGER
DB
1902
1910
WEB ANALYZER
1941
1914

FIG. 19

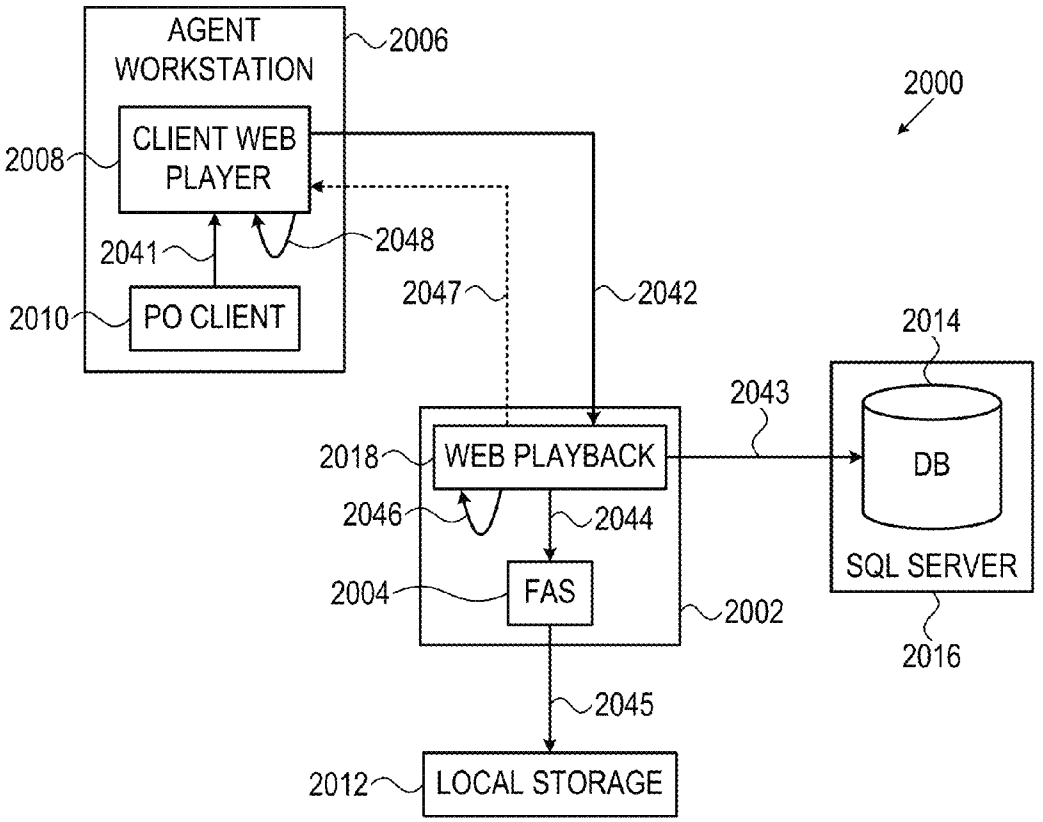

AGENT WORKSTATION
2006
2000
CLIENT WEB PLAYER
2008
2041
2048
2047
2042
2010
PO CLIENT
2014
2043
2018
WEB PLAYBACK
DB
2046
2044
2004
FAS
2002
SQL SERVER
2016
2045
2012
LOCAL STORAGE

FIG. 20

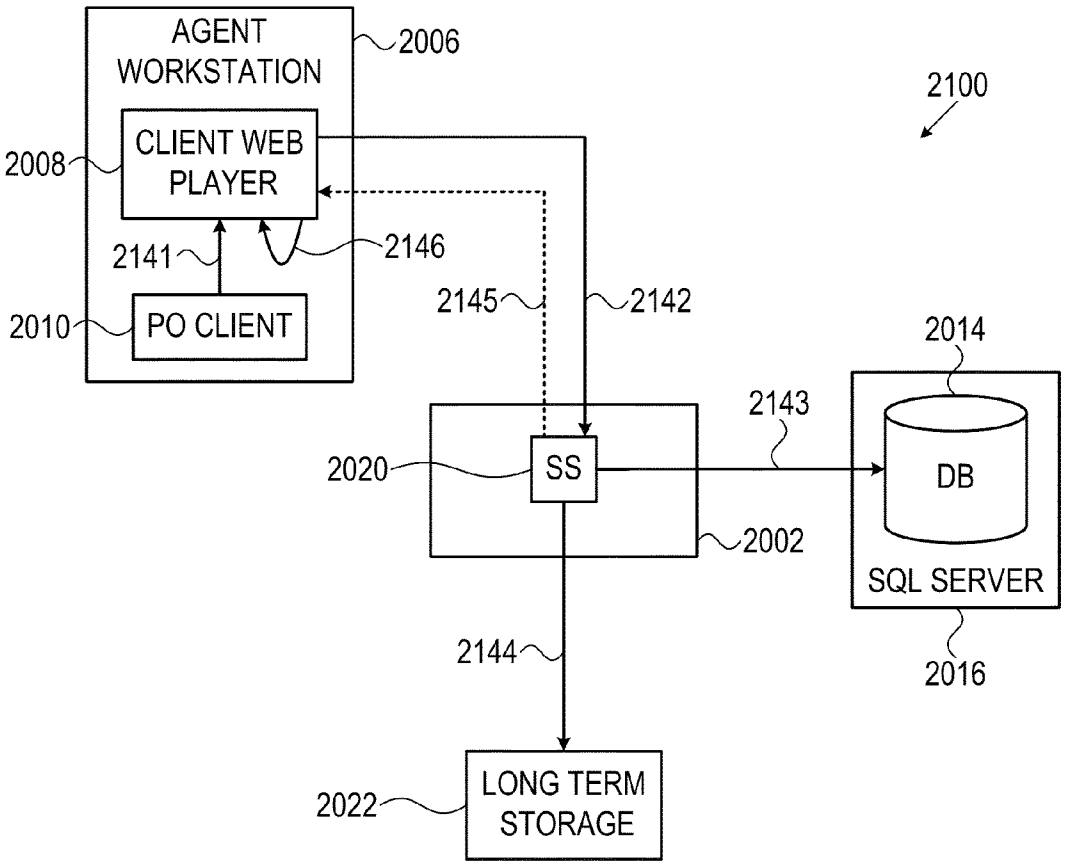

AGENT WORKSTATION
2006
2100
CLIENT WEB PLAYER
2008
2141
2146
2145
2142
2010
PO CLIENT
2014
2143
2020
SS
DB
2002
SQL SERVER
2016
2144
2022
LONG TERM STORAGE

FIG. 21

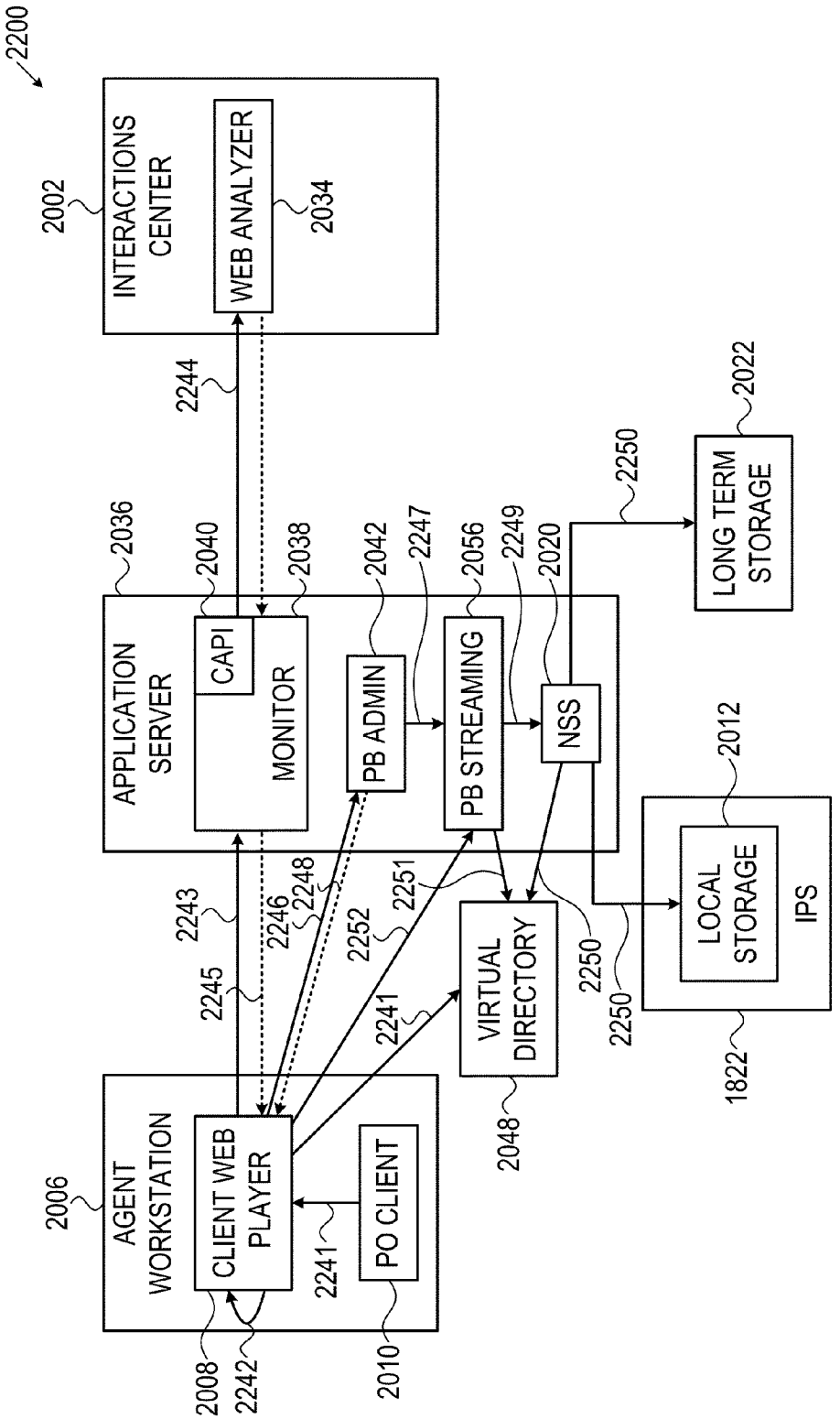

2200
INTERACTIONS CENTER
2002
WEB ANALYZER
2034
2244
APPLICATION SERVER
2036
CAPI
2040
MONITOR
2038
PB ADMIN
2042
PB STREAMING
2056
NSS
2020
2247
2249
2250
LONG TERM STORAGE
2022
2012
LOCAL STORAGE
IPS
1822
2250
2250
2243
2245
2246
2248
2252
2251
2241
VIRTUAL DIRECTORY
2048
AGENT WORKSTATION
2006
CLIENT WEB PLAYER
2241
PO CLIENT
2008
2242
2010

FIG. 22

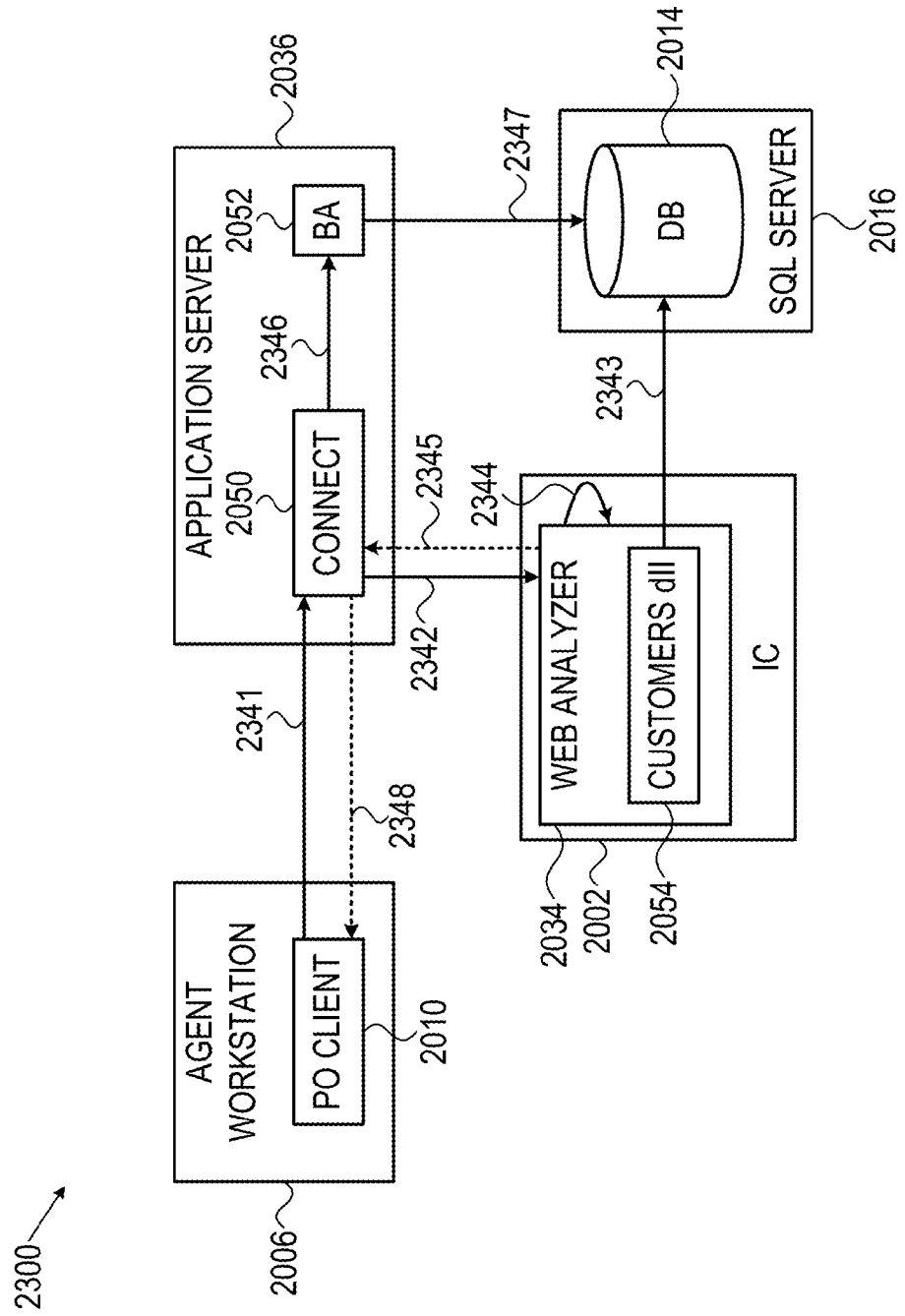

2300
AGENT WORKSTATION
PO CLIENT
2010
2006
APPLICATION SERVER
2036
BA
2052
CONNECT
2050
2346
2341
2348
2342
2345
2344
2347
2343
WEB ANALYZER
CUSTOMERS dll
IC
2034
2002
2054
DB
2014
SQL SERVER
2016

FIG. 23

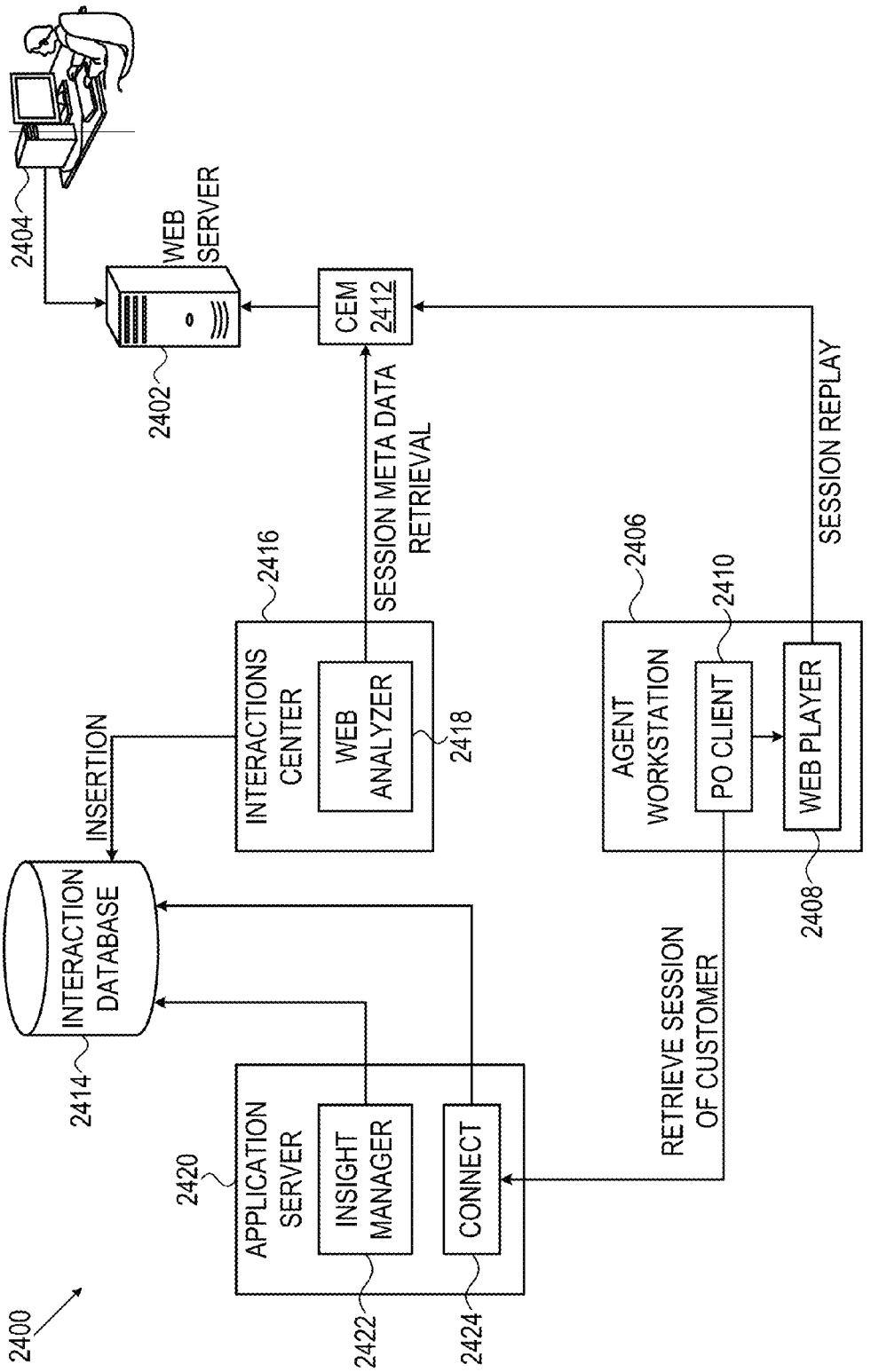

2400
2404
WEB SERVER
2402
CEM 2412
SESSION META DATA RETRIEVAL
SESSION REPLAY
2416
INTERACTIONS CENTER
WEB ANALYZER
2418
2406
AGENT WORKSTATION
2410
PO CLIENT
WEB PLAYER
2408
INSERTION
INTERACTION DATABASE
2414
RETRIEVE SESSION OF CUSTOMER
2420
APPLICATION SERVER
INSIGHT MANAGER
CONNECT
2422
2424

FIG. 24

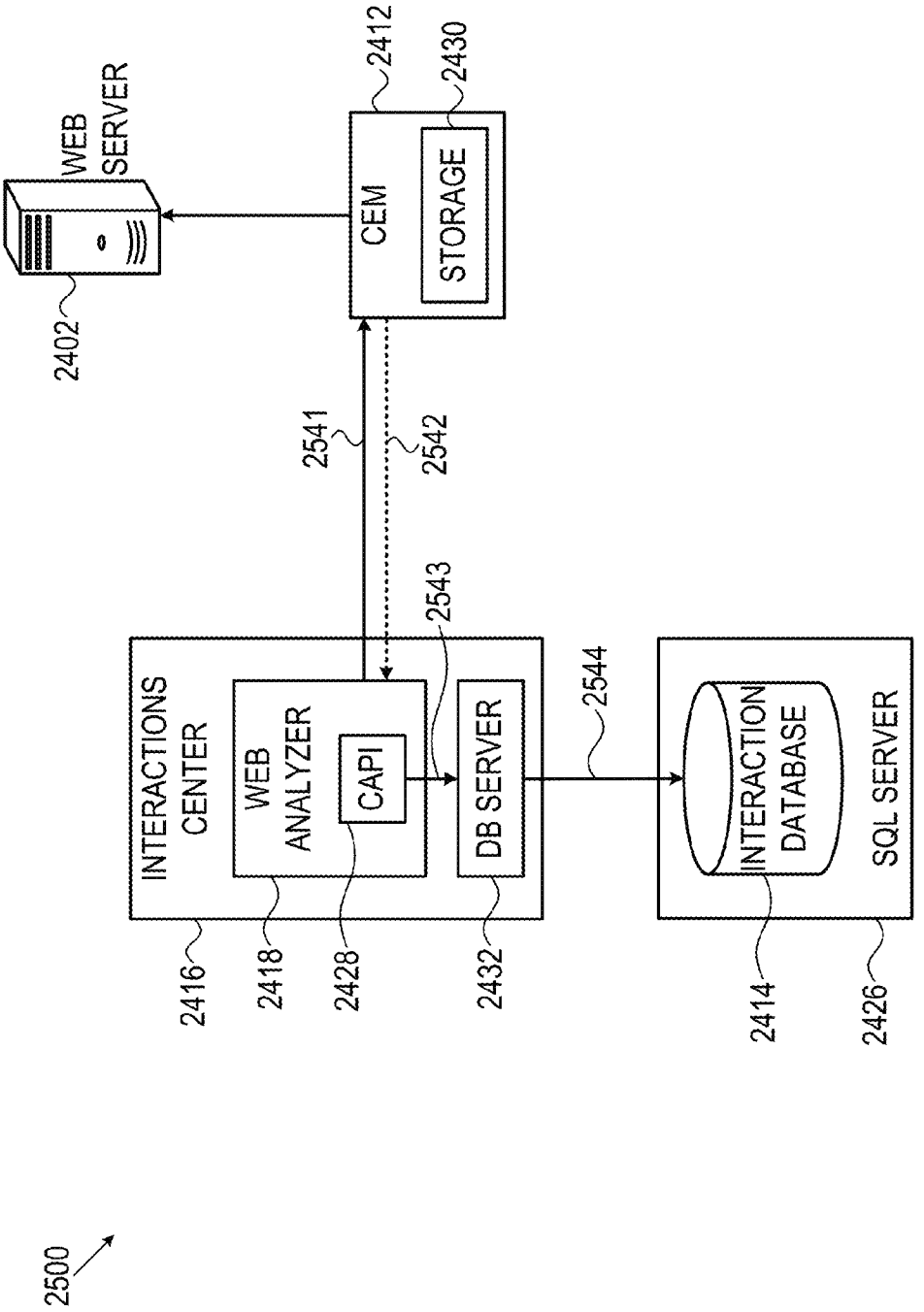

WEB SERVER
2402
2412
2430
CEM
STORAGE
2541
2542
2543
INTERACTIONS CENTER
WEB ANALYZER
CAPI
DB SERVER
2544
INTERACTION DATABASE
SQL SERVER
2416
2418
2428
2432
2414
2426
2500

FIG. 25

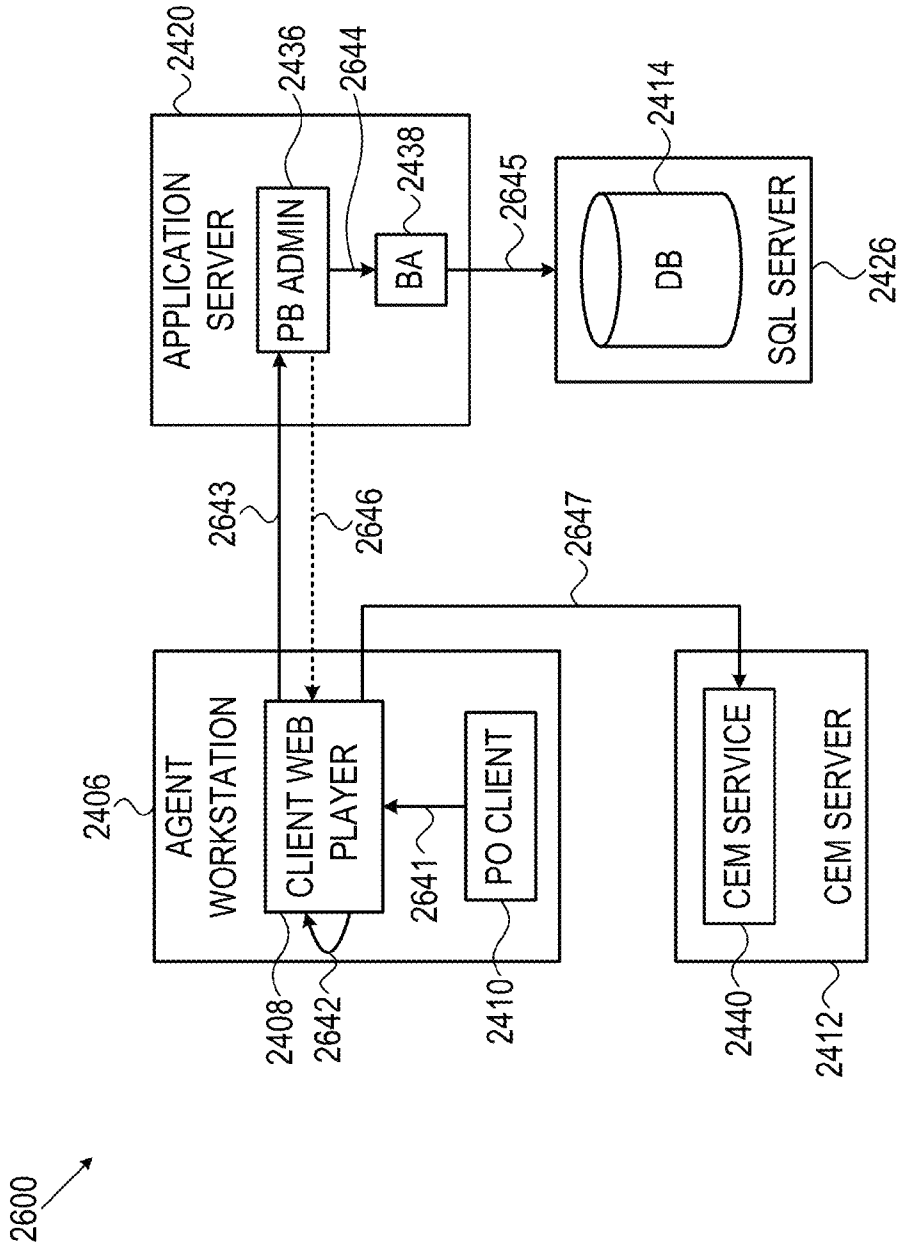

2600
2406
AGENT WORKSTATION
CLIENT WEB PLAYER
PO CLIENT
2641
2408
2642
2410
2643
2646
2647
2420
APPLICATION SERVER
PB ADMIN
2436
2644
BA
2438
2645
2414
DB
SQL SERVER
2426
CEM SERVICE
CEM SERVER
2440
2412

FIG. 26

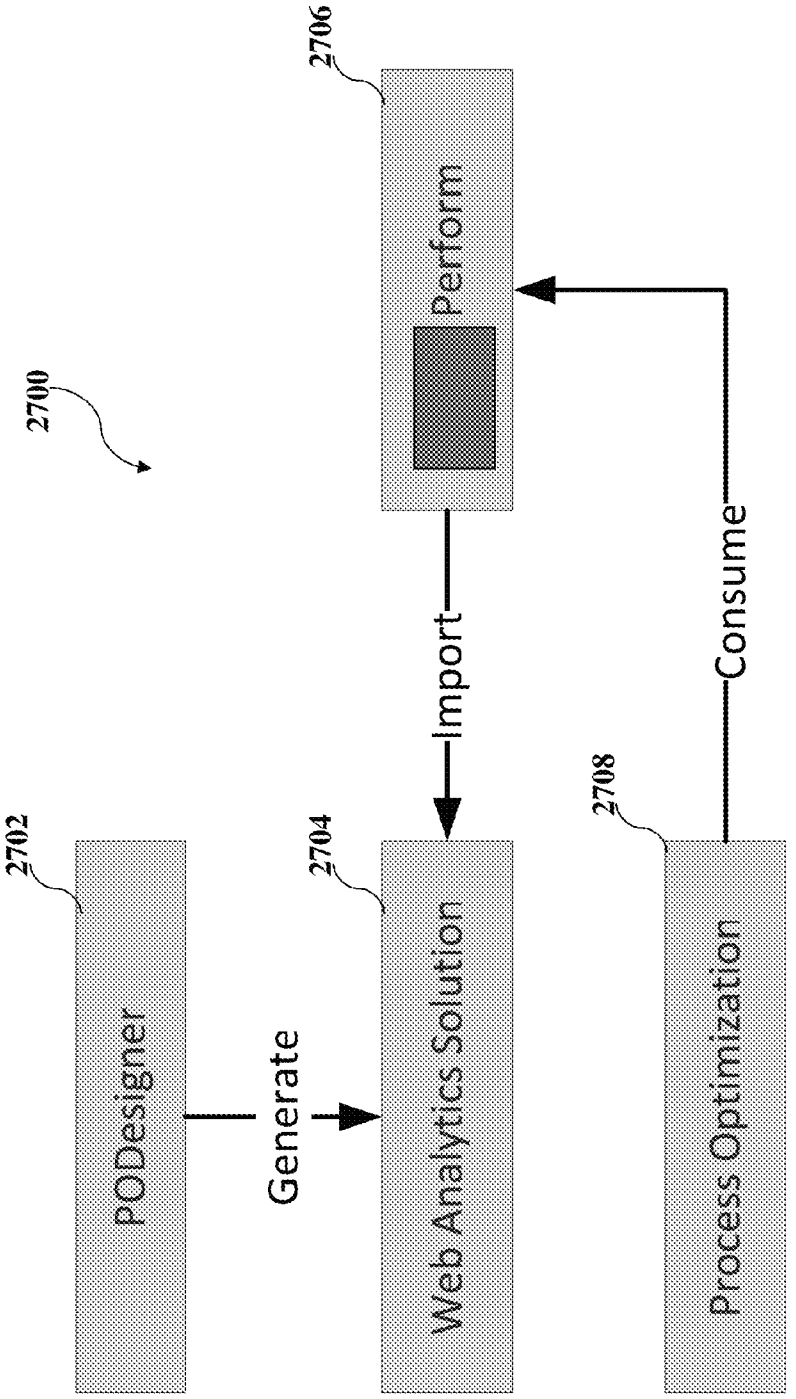

2706
Perform
2700
Import
Consume
2702
2704
2708
PODesigner
Generate
Web Analytics Solution
Process Optimization

Fig. 27

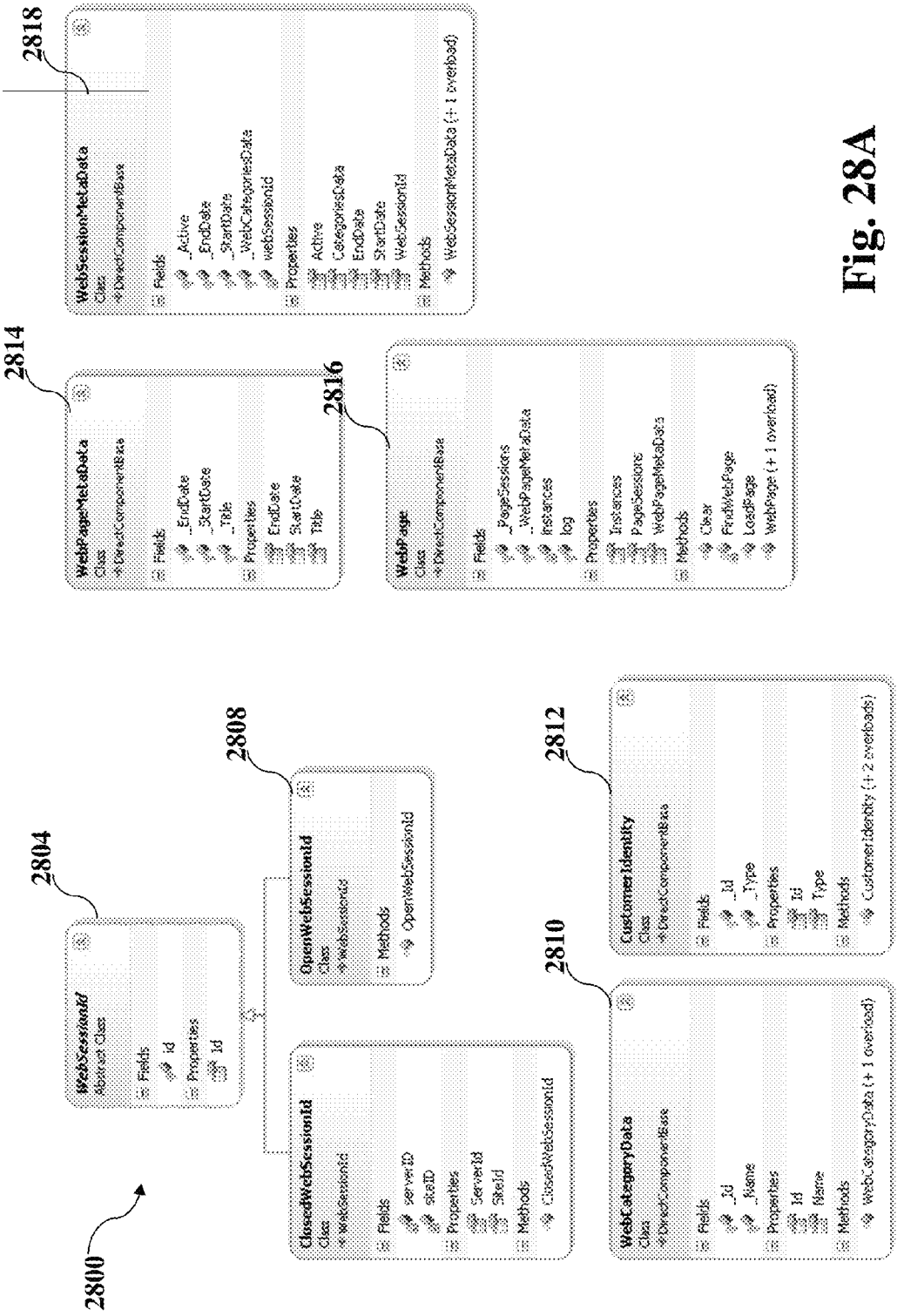

2800
2804
2808
2810
2812
2814
2816
2818
WebSessionId
Abstract Class
Fields
Id
Properties
Id
OpenWebSessionId
Class
WebSessionId
Methods
OpenWebSessionId
ClosedWebSessionId
Class
WebSessionId
Fields
serverID
siteID
Properties
ServerId
SiteId
Methods
ClosedWebSessionId
CustomerIdentity
Class
DirectComponentBase
Fields
_Id
_Type
Properties
Id
Type
Methods
CustomerIdentity (+ 2 overloads)
WebCategoryData
Class
DirectComponentBase
Fields
_Id
_Name
Properties
Id
Name
Methods
WebCategoryData (+ 1 overload)
WebPageMetaData
Class
DirectComponentBase
Fields
_EndDate
_StartDate
_Title
Properties
EndDate
StartDate
Title
WebPage
Class
DirectComponentBase
Fields
_PageSessions
_WebPageMetaData
instances
log
Properties
Instances
PageSessions
WebPageMetaData
Methods
Clear
FindWebPage
LoadPage
WebPage (+ 1 overload)
WebSessionMetaData
Class
DirectComponentBase
Fields
_Active
_EndDate
_StartDate
_WebCategoriesData
webSessionId
Properties
Active
CategoriesData
EndDate
StartDate
WebSessionId
Methods
WebSessionMetaData (+ 1 overload)

Fig. 28A


2802
2820
Website
Class
DirectComponentBase
Fields
_Domain
_MetaData
_Sessions
instances
log
manager
messageQueue
webPlayerInitialized
webSiteKey
Properties
Domain
Manager
MessageQueue
MetaData
Sessions
WebSiteKey
Methods
AsyncLoadCustomerSessionsDataCompleted
AsyncLoadRecentCustomerSessionsDataCompleted
Clear
CreatWebInteractionRequest
DoWorkOfGetRecentSessionsMetaDataAsync
DoWorkOfLoadCustomerSessionsDataAsync
DoWorkOfLoadRecentCustomerSessionsDataAsync
FindWebSite
FireDataLoadedEvent (+ 1 overload)
GetRecentSessionsMetaData
GetRecentSessionsMetaDataAsync
GetRecentSessionsMetaDataAsyncCompleted
GetWebInteractionSessionArr
HandleNewPageType
InitWebPlayer
InnerLoadData (+ 1 overload)
InnerLoadMetaData
IsSafeToContinue
LoadCompositeProperties
LoadCustomerSessionsDataFromMetaDataAsync
LoadCustomerSessionsDataFromMetataData
LoadPageProperties
LoadPrimitiveProperties
LoadRecentCustomerSessionsData
LoadRecentCustomerSessionsDataAsync
LoadSession
LoadWebPageMetaData (+ 1 overload)
LoadWebsiteWithData
PlayCurrentSession
PlaySession
SetPageInstancesAndMetaData
StartPlayer (+ 1 overload)
TestWebPlayer
Website (+ 1 overload)
Events
DataLoaded
MetaDataLoaded
Nested Types

Fig. 28B

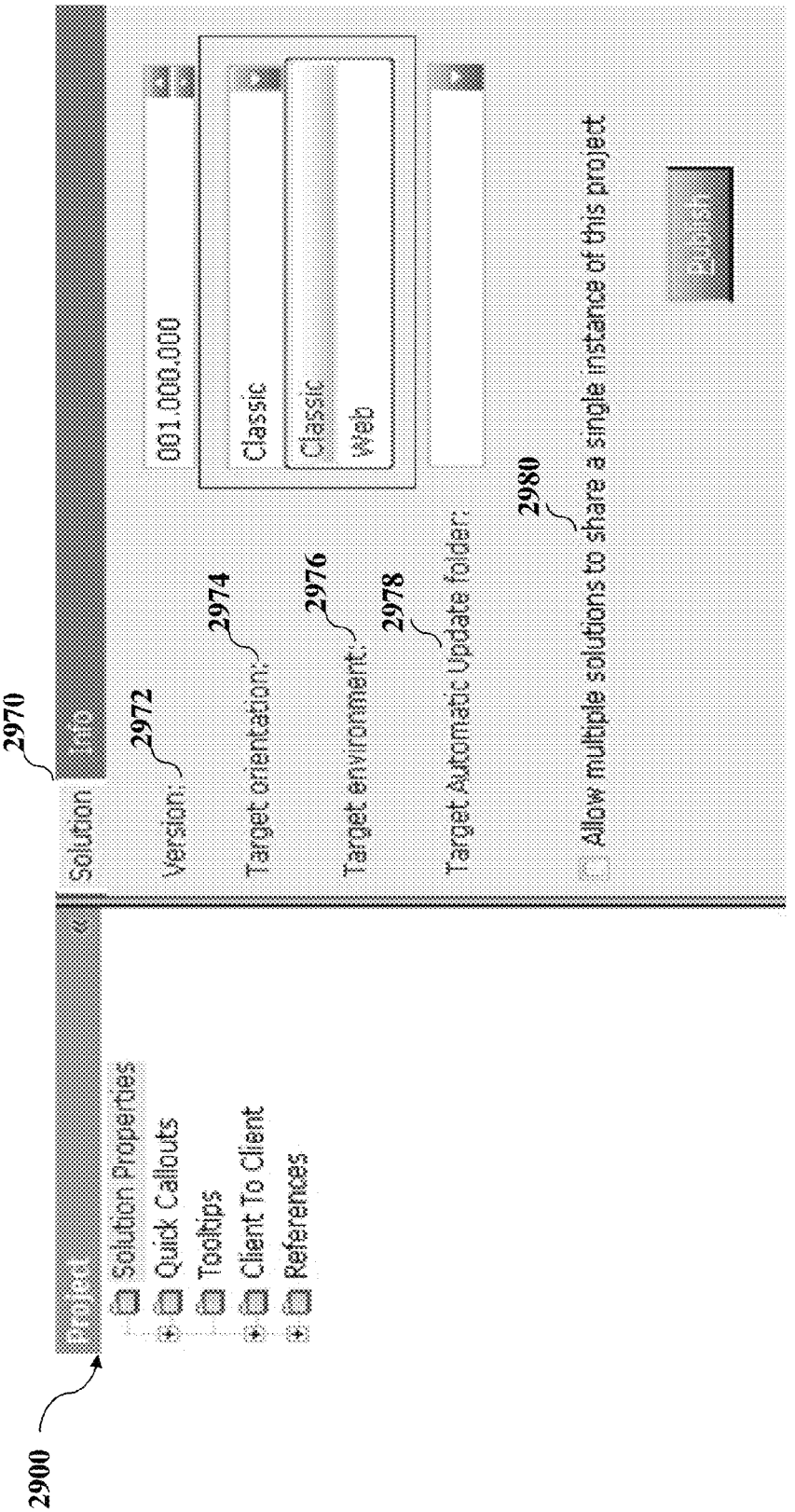

2900
Project
Solution Properties
Quick Callouts
Tooltips
Client To Client
References
2970
Solution
Title
2972
Version:
001.000.000
2974
Target orientation:
Classic
2976
Target environment:
Classic
Web
2978
Target Automatic Update folder:
2980
Allow multiple solutions to share a single instance of this project

Fig. 29A

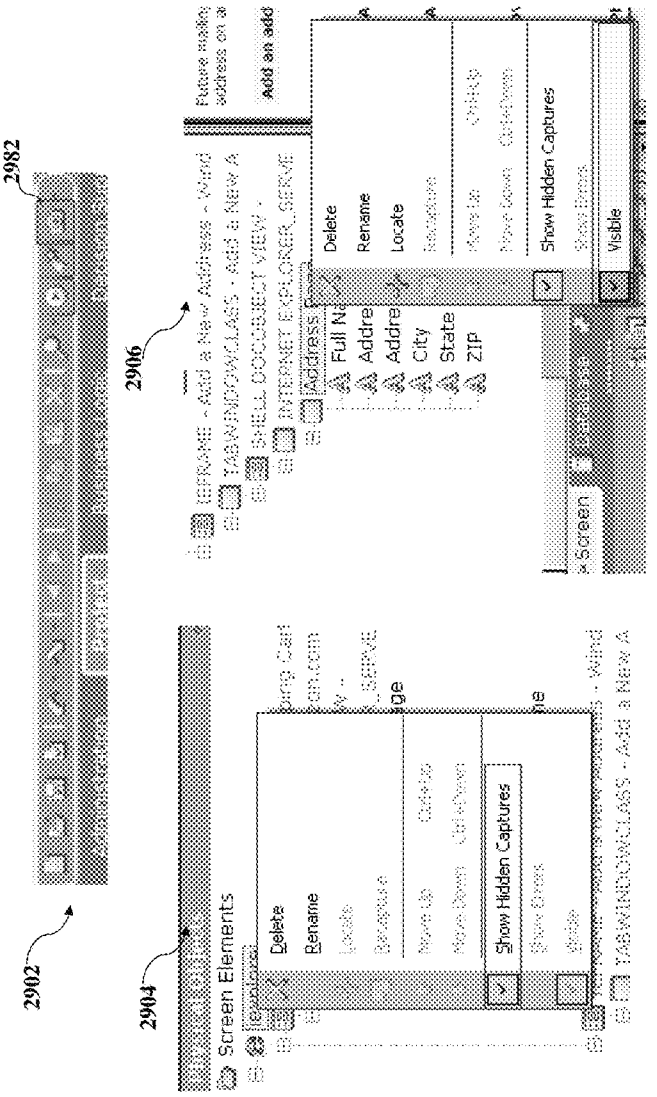

2902
2904
2906
2982
Screen Elements
Delete
Rename
Show Hidden Captures
Visible
Screen

Fig. 29B

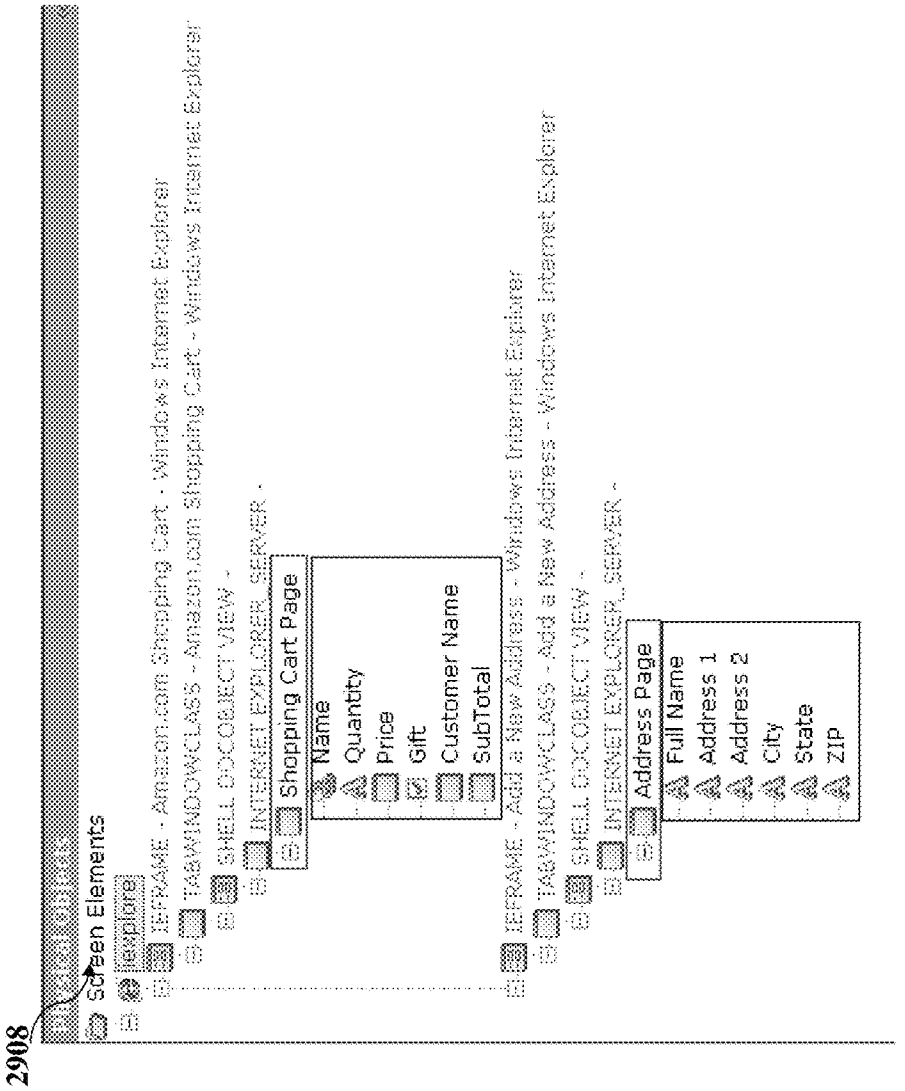

2908
Screen Elements
iexplore
IEFRAME - Amazon.com Shopping Cart - Windows Internet Explorer
TABWINDOWCLASS - Amazon.com Shopping Cart - Windows Internet Explorer
SHELL DOCOBJECT VIEW -
INTERNET EXPLORER_SERVER -
Shopping Cart Page
Name
Quantity
Price
Gift
Customer Name
SubTotal
IEFRAME - Add a New Address - Windows Internet Explorer
TABWINDOWCLASS - Add a New Address - Windows Internet Explorer
SHELL DOCOBJECT VIEW -
INTERNET EXPLORER_SERVER -
Address Page
Full Name
Address 1
Address 2
City
State
ZIP

Fig. 29C

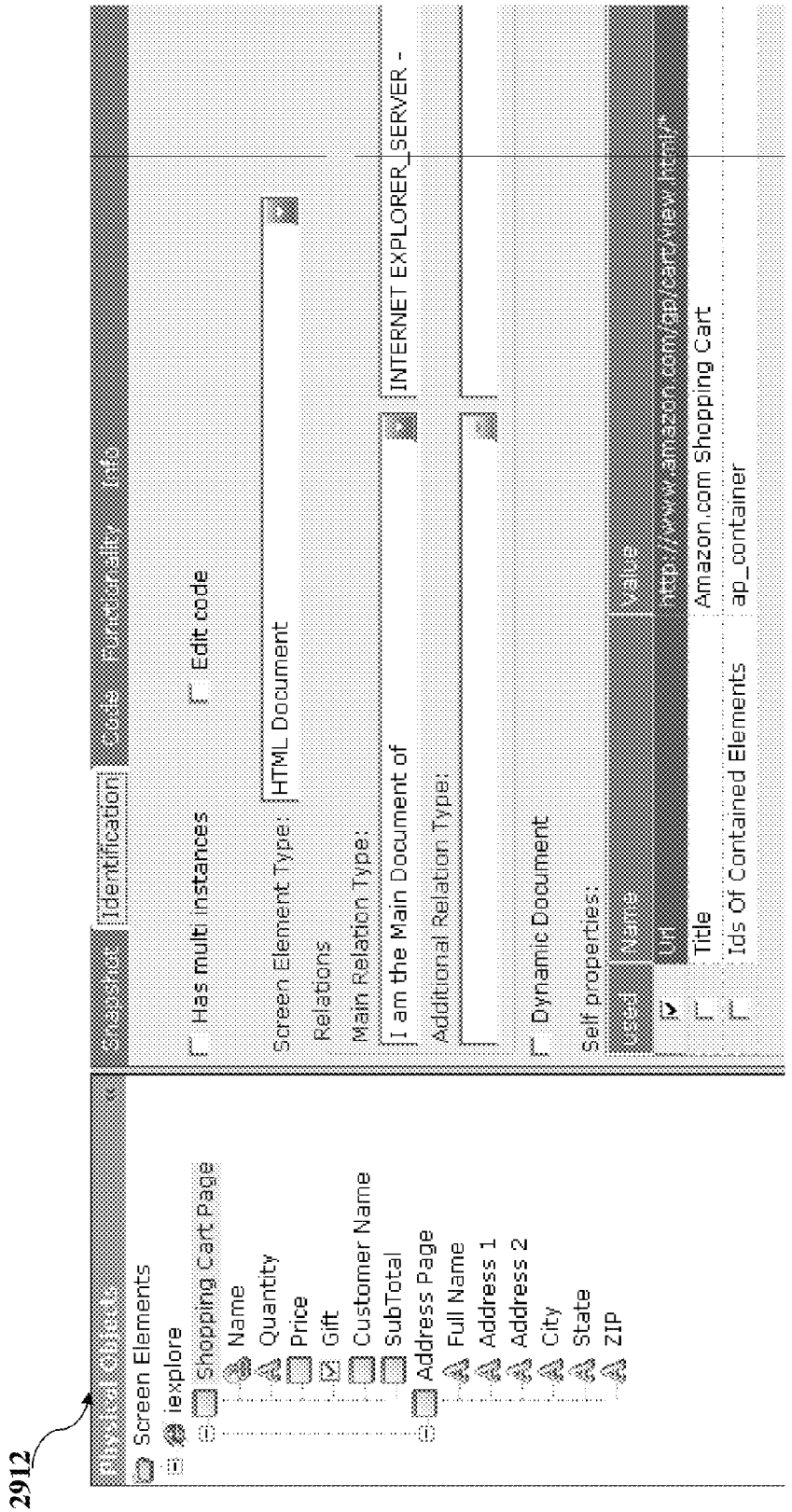

2912
Screen Elements
iexplore
Shopping Cart Page
Name
Quantity
Price
Gift
Customer Name
SubTotal
Address Page
Full Name
Address 1
Address 2
City
State
ZIP
Has multi instances
Edit code
Screen Element Type:
HTML Document
Relations
Main Relation Type:
I am the Main Document of
INTERNET EXPLORER_SERVER -
Additional Relation Type:
Dynamic Document
Self properties:
Title
Amazon.com Shopping Cart
Ids Of Contained Elements
ap_container

Fig. 29D

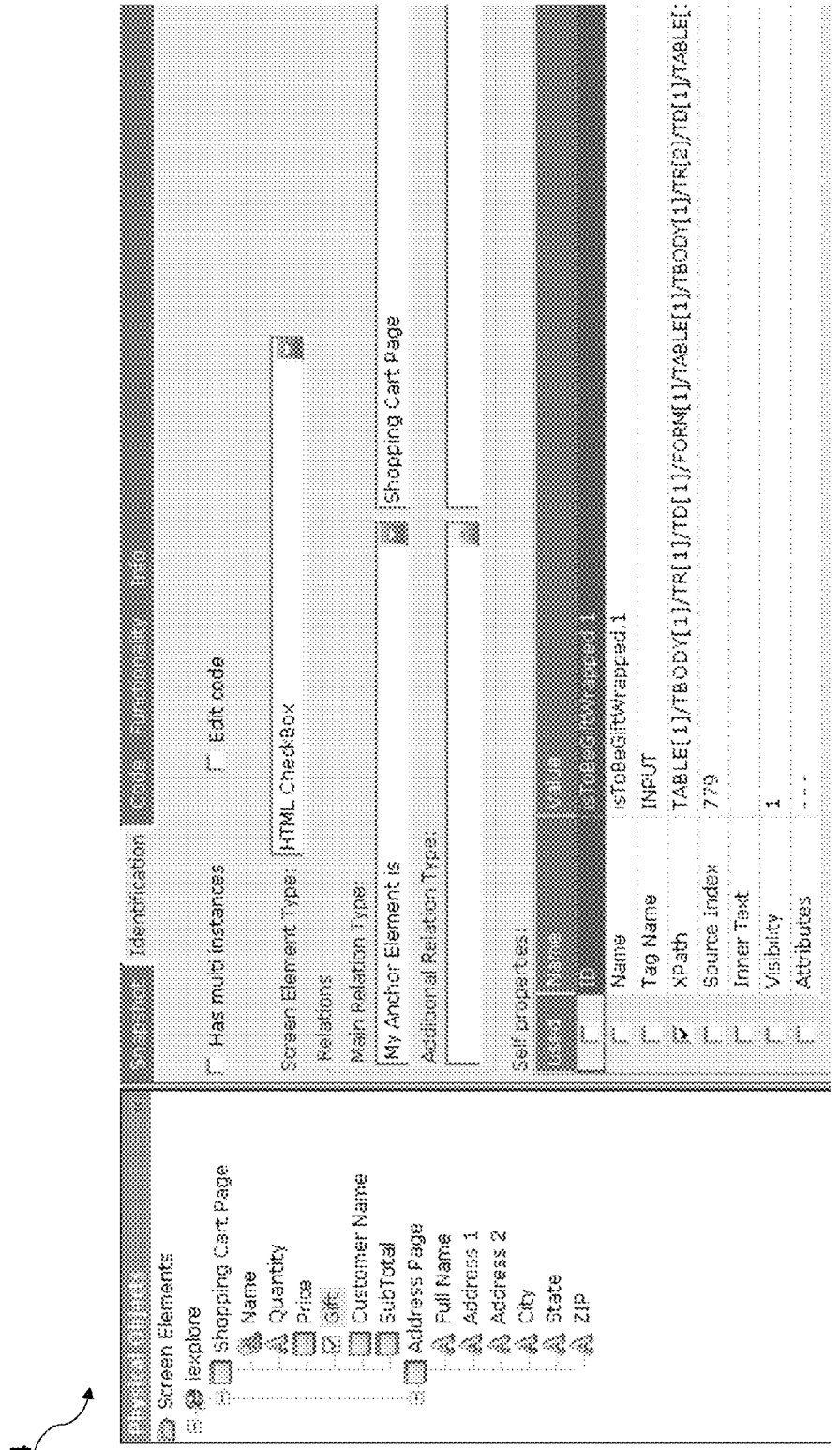
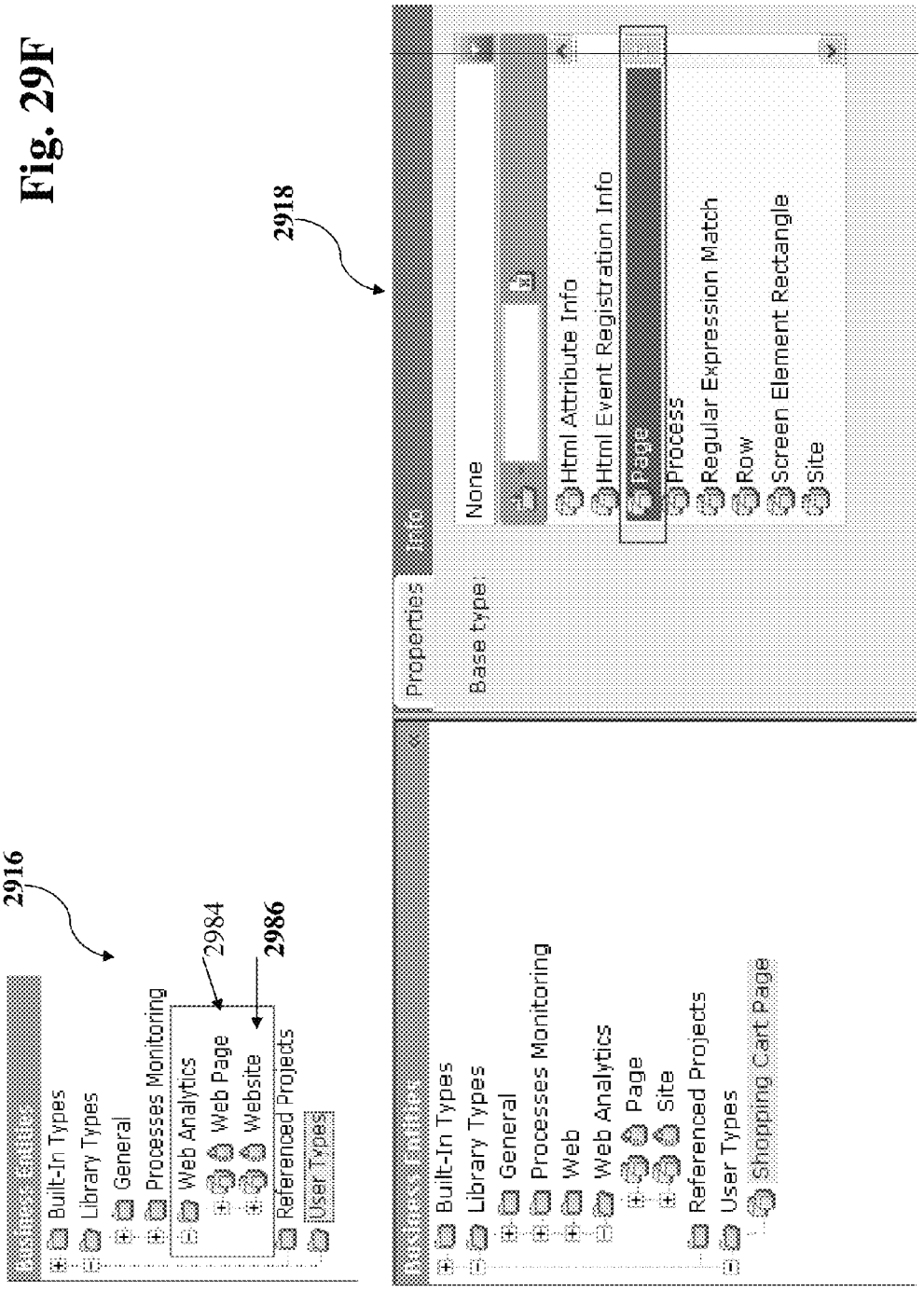

2914
Screen Elements
iexplore
Shopping Cart Page
Name
Quantity
Price
Gift
Customer Name
SubTotal
Address Page
Full Name
Address 1
Address 2
City
State
ZIP
Identification
Has multi instances
Edit code
Screen Element Type:
HTML CheckBox
Relations
Main Relation Type:
My Anchor Element is
Shopping Cart Page
Additional Relation Type:
Self properties:
Name
Tag Name
XPath
Source Index
Inner Text
Visibility
Attributes
isToBeGiftWrapped.1
INPUT
TABLE[1]/TBODY[1]/TR[1]/TD[1]/FORM[1]/TABLE[1]/TBODY[1]/TR[2]/TD[1]/TABLE[
779
1

Fig. 29E

Fig. 29F


2916
2984
2986
2918
Built-In Types
Library Types
General
Processes Monitoring
Web Analytics
Web Page
Website
Referenced Projects
User Types
Properties
Base type:
None
Html Attribute Info
Html Event Registration Info
Page
Process
Regular Expression Match
Row
Screen Element Rectangle
Site
Web
Page
Site
Shopping Cart Page

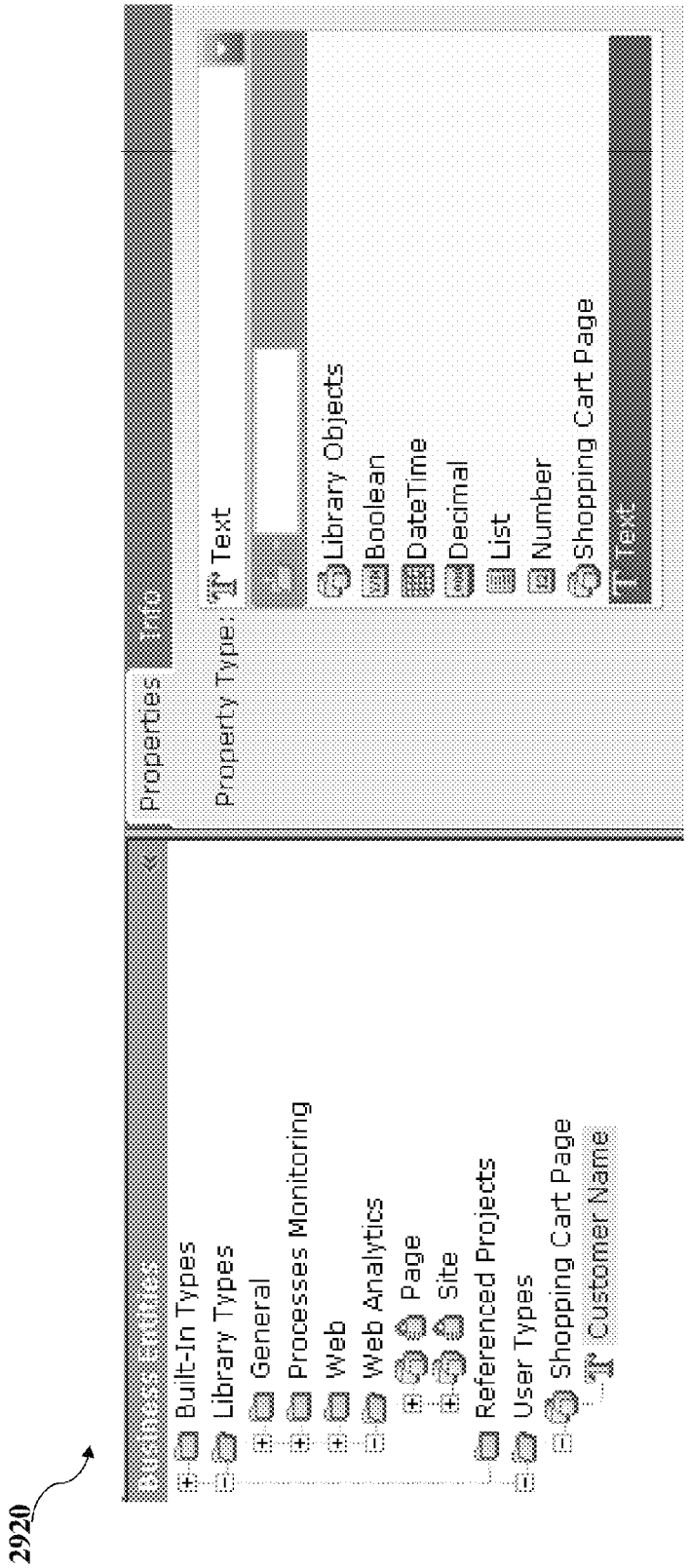

2920
Business Entities
Built-In Types
Library Types
General
Processes Monitoring
Web
Web Analytics
Page
Site
Referenced Projects
User Types
Shopping Cart Page
Customer Name
Properties
Info
Property Type:
Text
Library Objects
Boolean
DateTime
Decimal
List
Number
Shopping Cart Page
Text

Fig. 29G

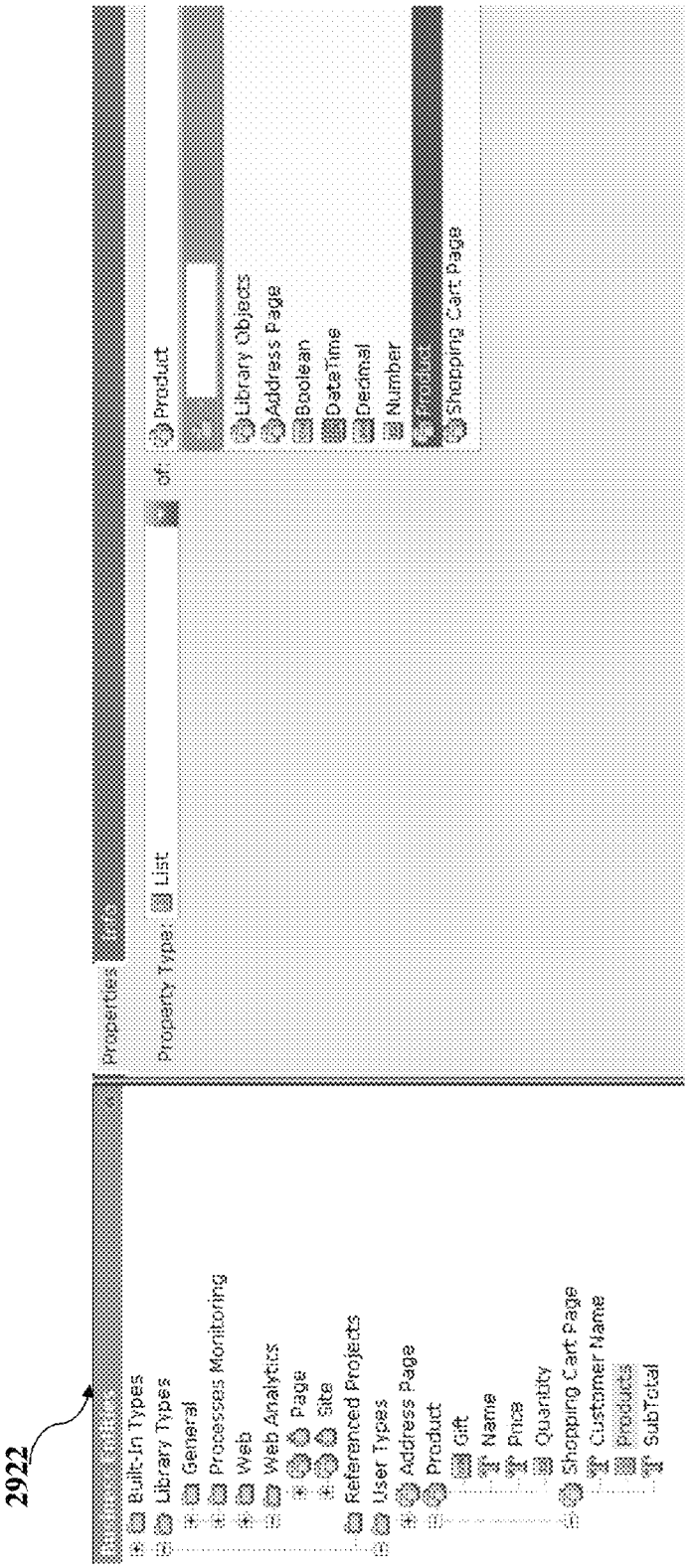

2922
Built-In Types
Library Types
General
Processes Monitoring
Web
Web Analytics
Page
Site
Referenced Projects
User Types
Address Page
Product
Gift
Name
Price
Quantity
Shopping Cart Page
Customer Name
Products
SubTotal
Properties
Property Type:
List
of:
Product
Library Objects
Address Page
Boolean
DateTime
Decimal
Number
Shopping Cart Page

Fig. 29H

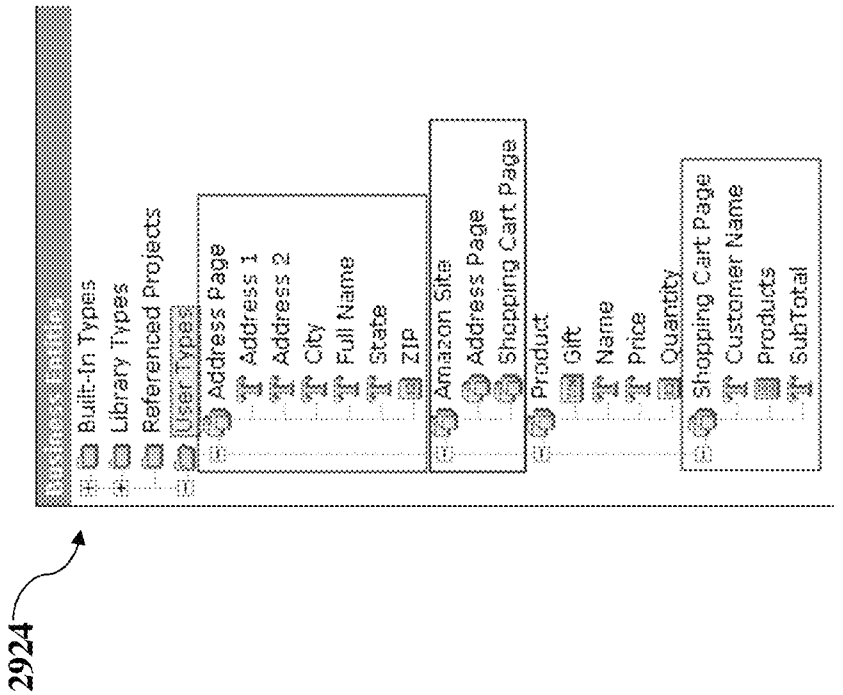

Built-In Types
Library Types
Referenced Projects
User Types
Address Page
Address 1
Address 2
City
Full Name
State
Zip
Amazon Site
Address Page
Shopping Cart Page
Product
Gift
Name
Price
Quantity
Shopping Cart Page
Customer Name
Products
SubTotal
2924

Fig. 29I

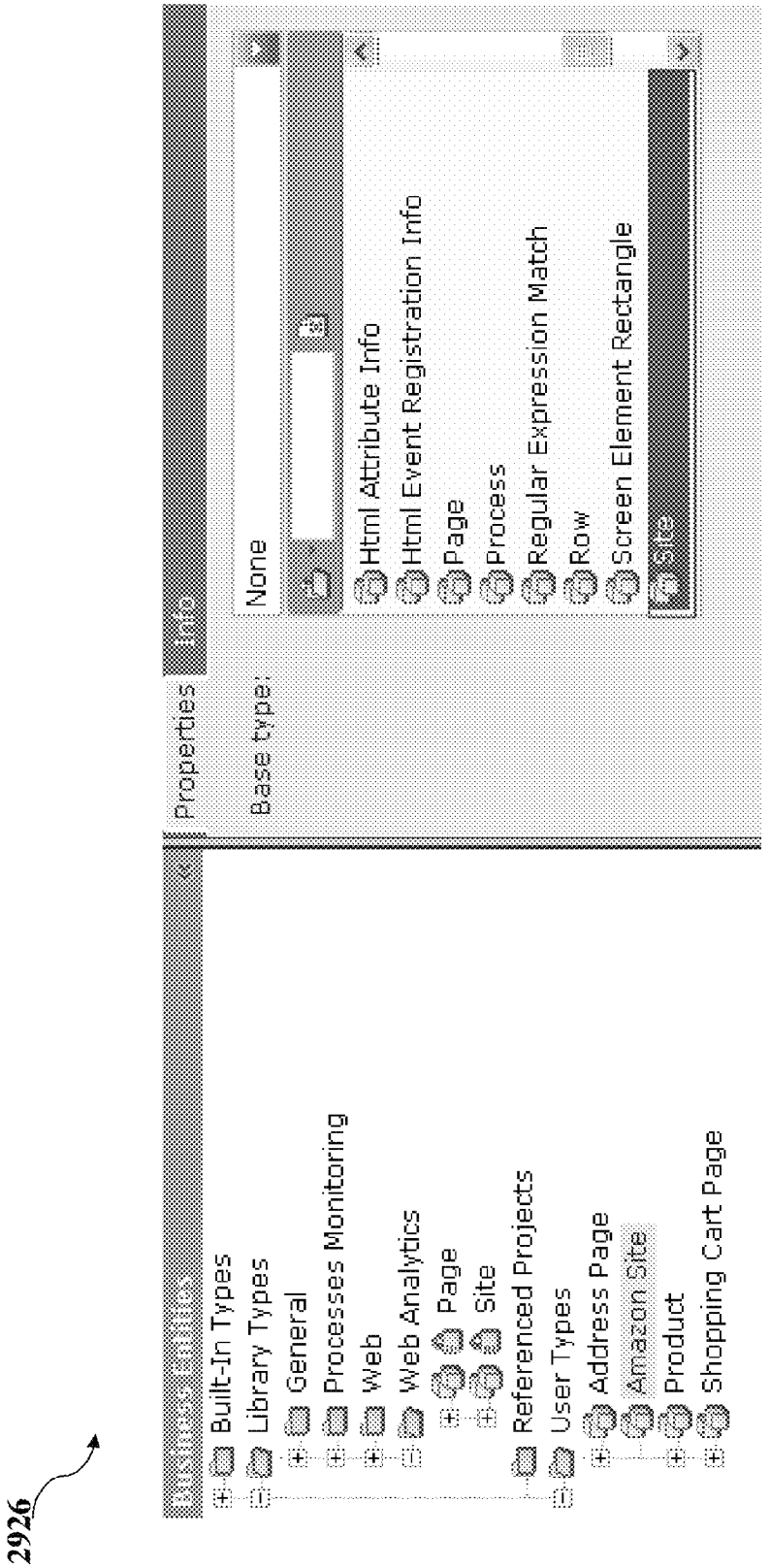

2926
Business Entities
Built-In Types
Library Types
General
Processes Monitoring
Web
Web Analytics
Page
Site
Referenced Projects
User Types
Address Page
Amazon Site
Product
Shopping Cart Page
Properties
Info
Base type:
None
Html Attribute Info
Html Event Registration Info
Page
Process
Regular Expression Match
Row
Screen Element Rectangle
Site

Fig. 29J

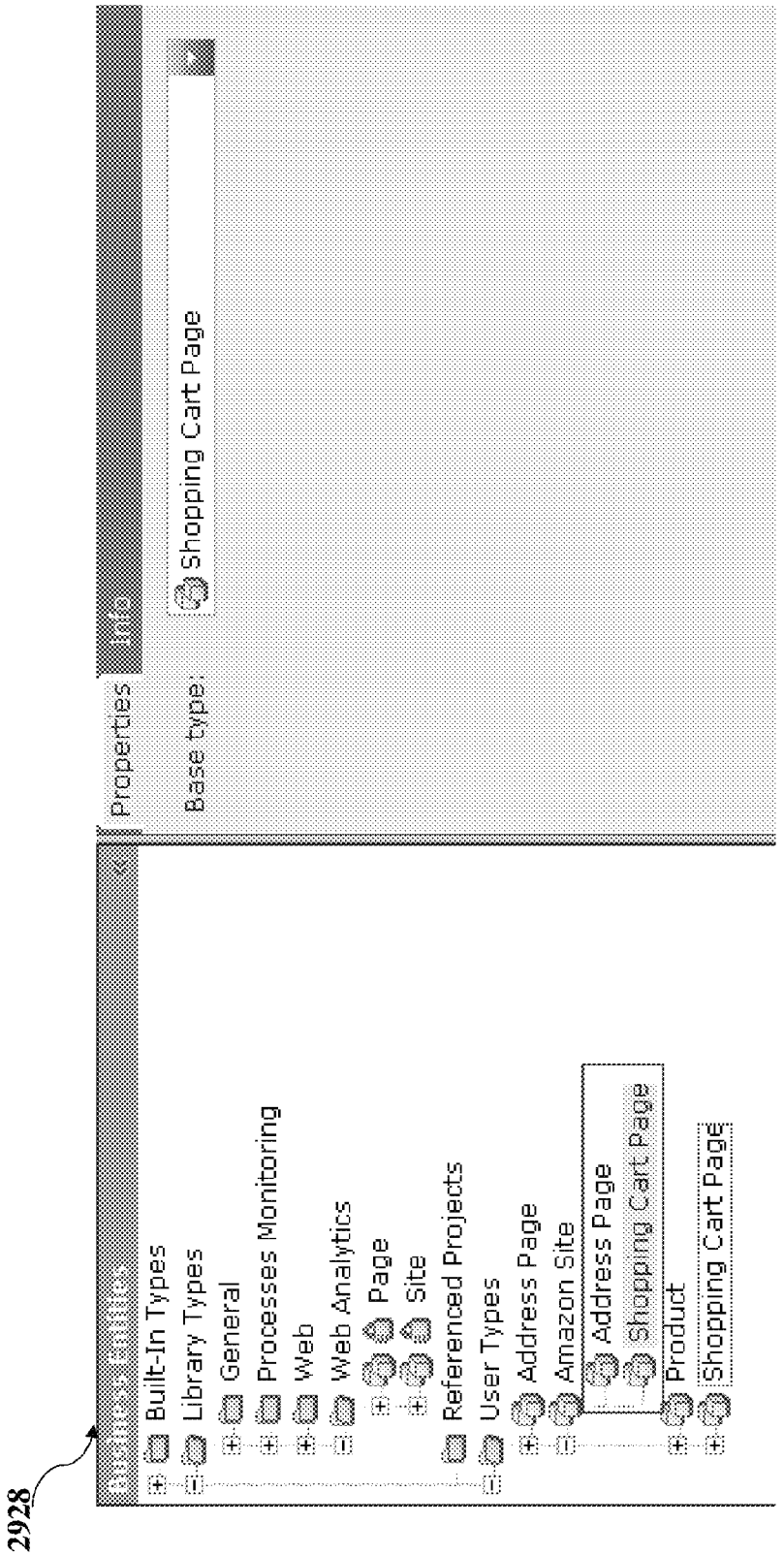

2928
Business Entities
Built-In Types
Library Types
General
Processes Monitoring
Web
Web Analytics
Page
Site
Referenced Projects
User Types
Address Page
Amazon Site
Address Page
Shopping Cart Page
Product
Shopping Cart Page
Properties
Info
Base type:
Shopping Cart Page

Fig. 29K

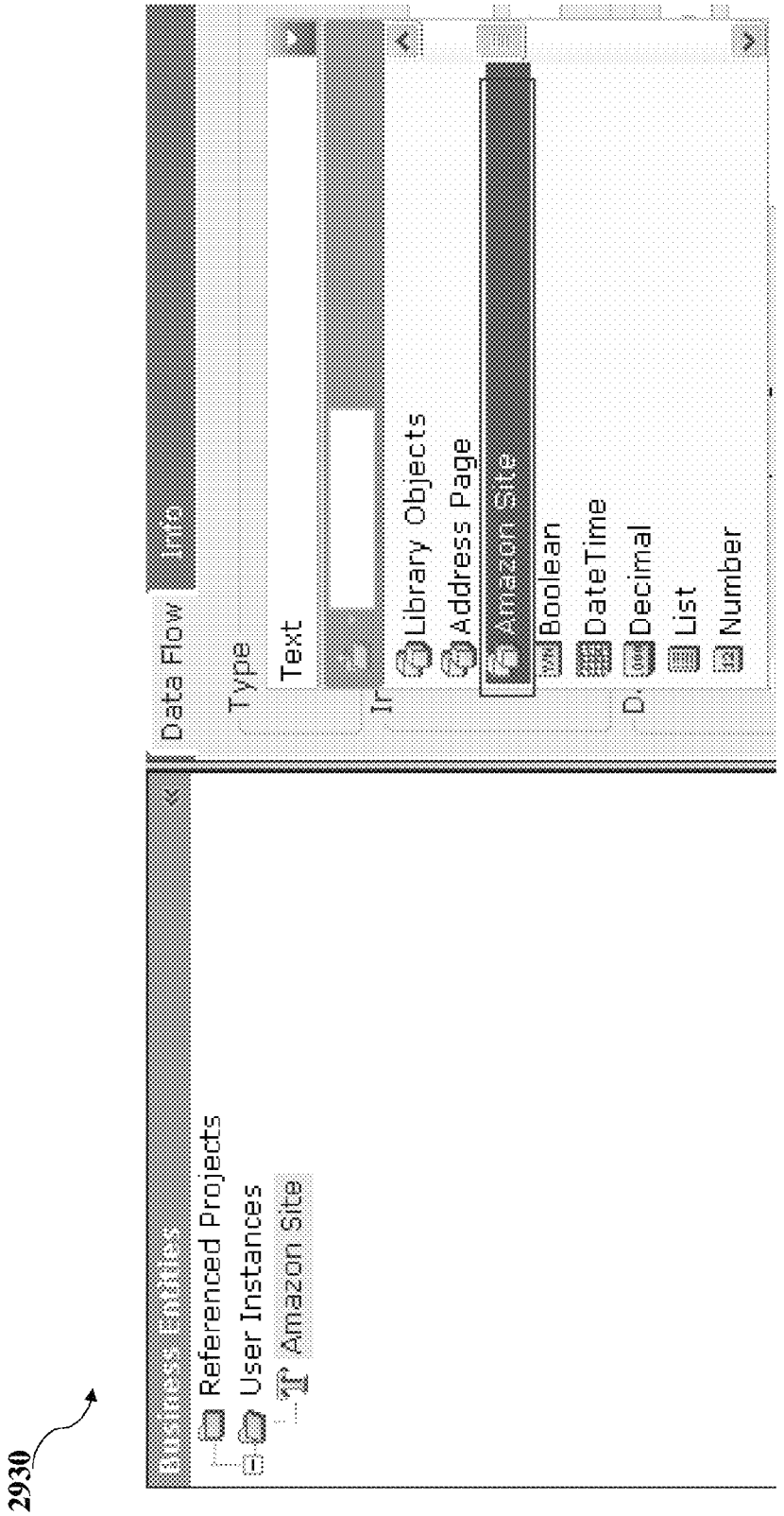

2930
Business Entities
Referenced Projects
User Instances
Amazon Site
Data Flow
Info
Type
Text
Library Objects
Address Page
Amazon Site
Boolean
DateTime
Decimal
List
Number

Fig. 29L

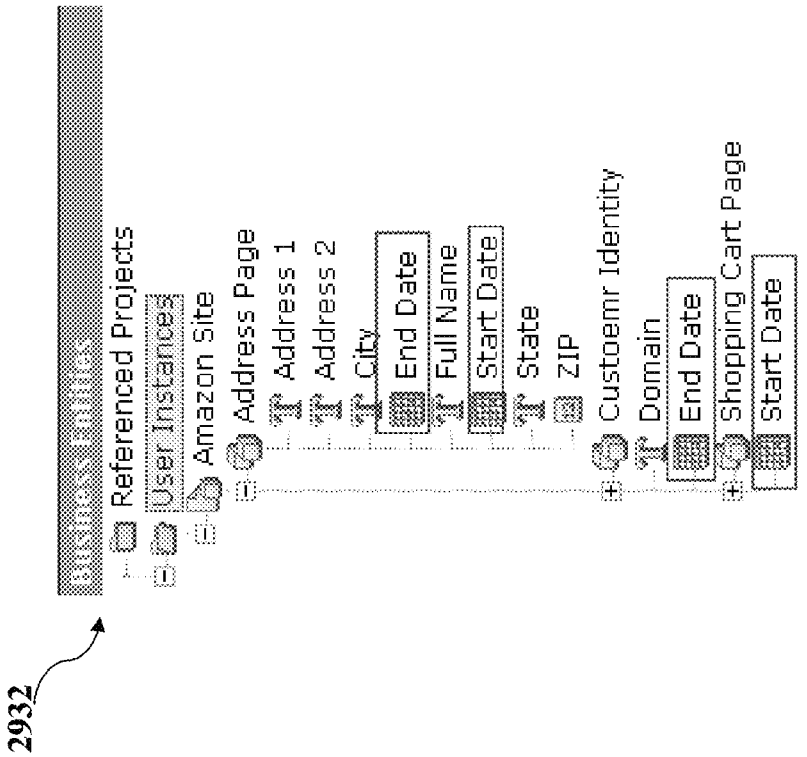

2932
Referenced Projects
User Instances
Amazon Site
Address Page
Address 1
Address 2
City
End Date
Full Name
Start Date
State
ZIP
Custoemr Identity
Domain
End Date
Shopping Cart Page
Start Date

Fig. 29M

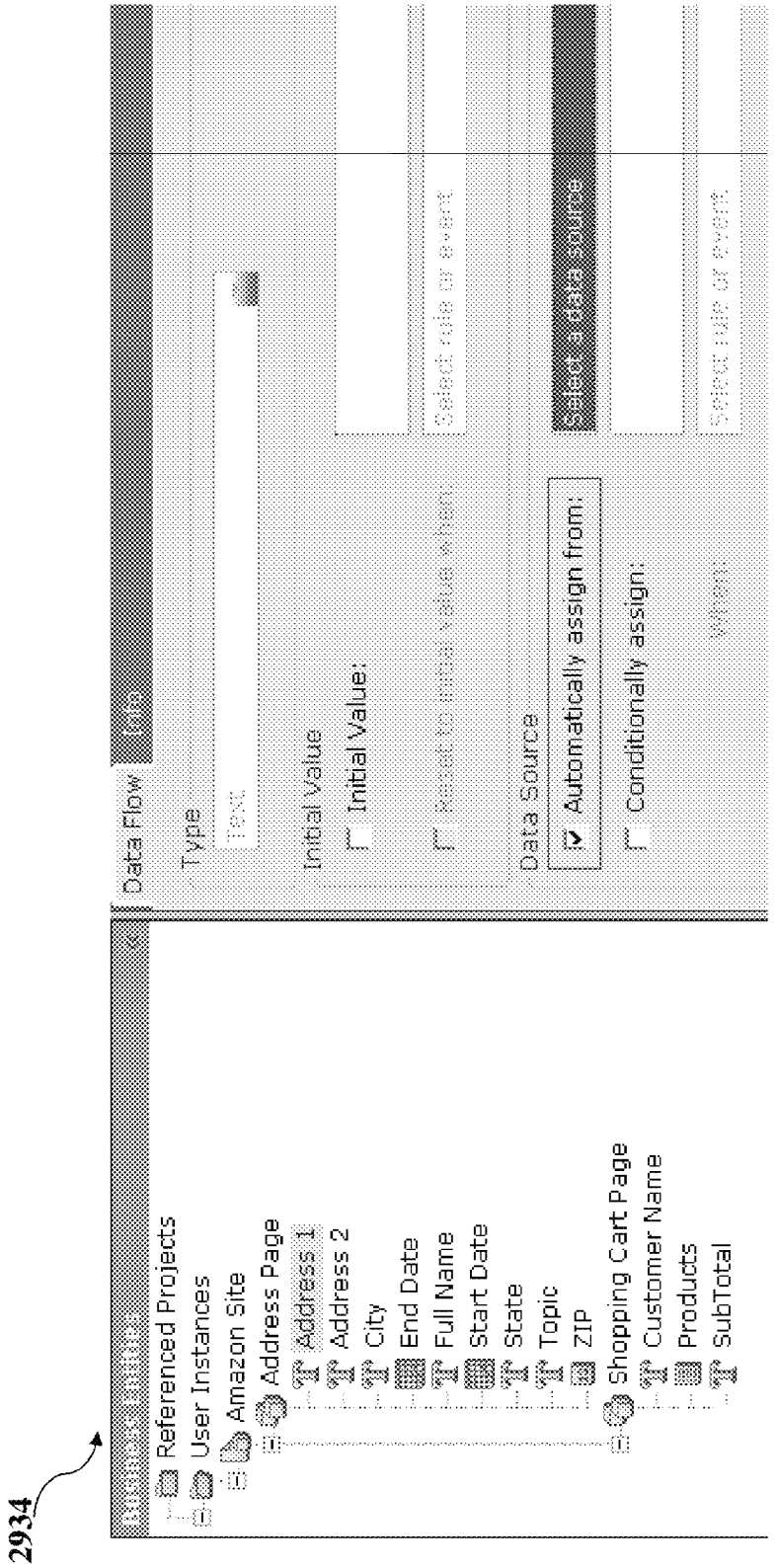

2934
Data Flow
Type
Initial Value
Initial Value:
Data Source
Automatically assign from:
Conditionally assign:
Referenced Projects
User Instances
Amazon Site
Address Page
Address 1
Address 2
City
End Date
Full Name
Start Date
State
Topic
ZIP
Shopping Cart Page
Customer Name
Products
SubTotal

Fig. 29N

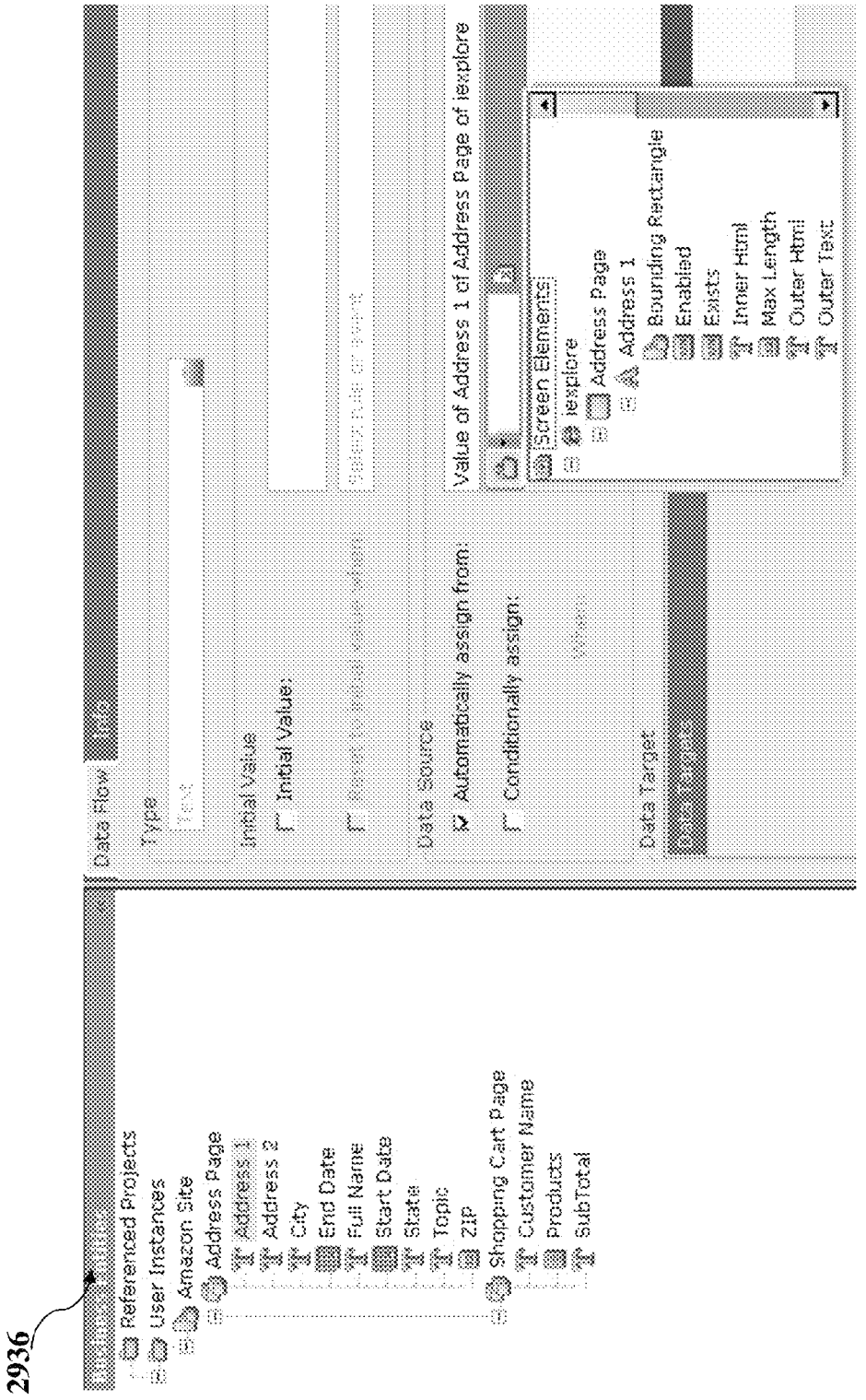

2936
Referenced Projects
User Instances
Amazon Site
Address Page
Address 1
Address 2
City
End Date
Full Name
Start Date
State
Topic
Zip
Shopping Cart Page
Customer Name
Products
SubTotal
Data Flow
Type
Initial Value
Initial Value:
Data Source
Automatically assign from:
Conditionally assign:
Value of Address 1 of Address Page of iexplore
Data Target
Screen Elements
iexplore
Address Page
Address 1
Bounding Rectangle
Enabled
Exists
Inner Html
Max Length
Outer Html
Outer Text

Fig. 29O

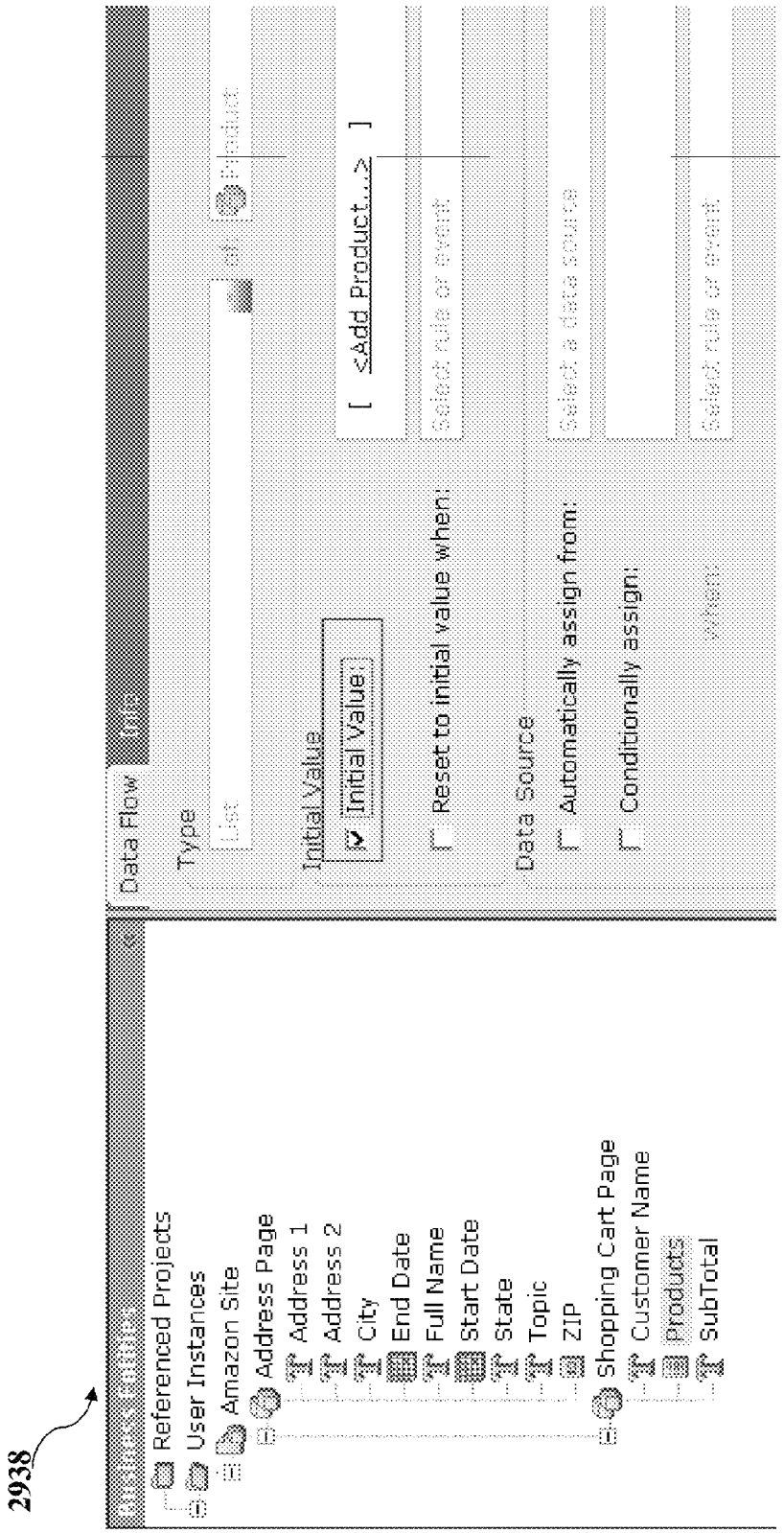

2938
Data Flow
Type
List
Primitive
Initial Value
Initial Value
[<Add Product...>]
Reset to initial value when:
Select rule or event
Data Source
Automatically assign from:
Select a data source
Conditionally assign:
When:
Select rule or event
Referenced Projects
User Instances
Amazon Site
Address Page
Address 1
Address 2
City
End Date
Full Name
Start Date
State
Topic
ZIP
Shopping Cart Page
Customer Name
Products
SubTotal

Fig. 29P

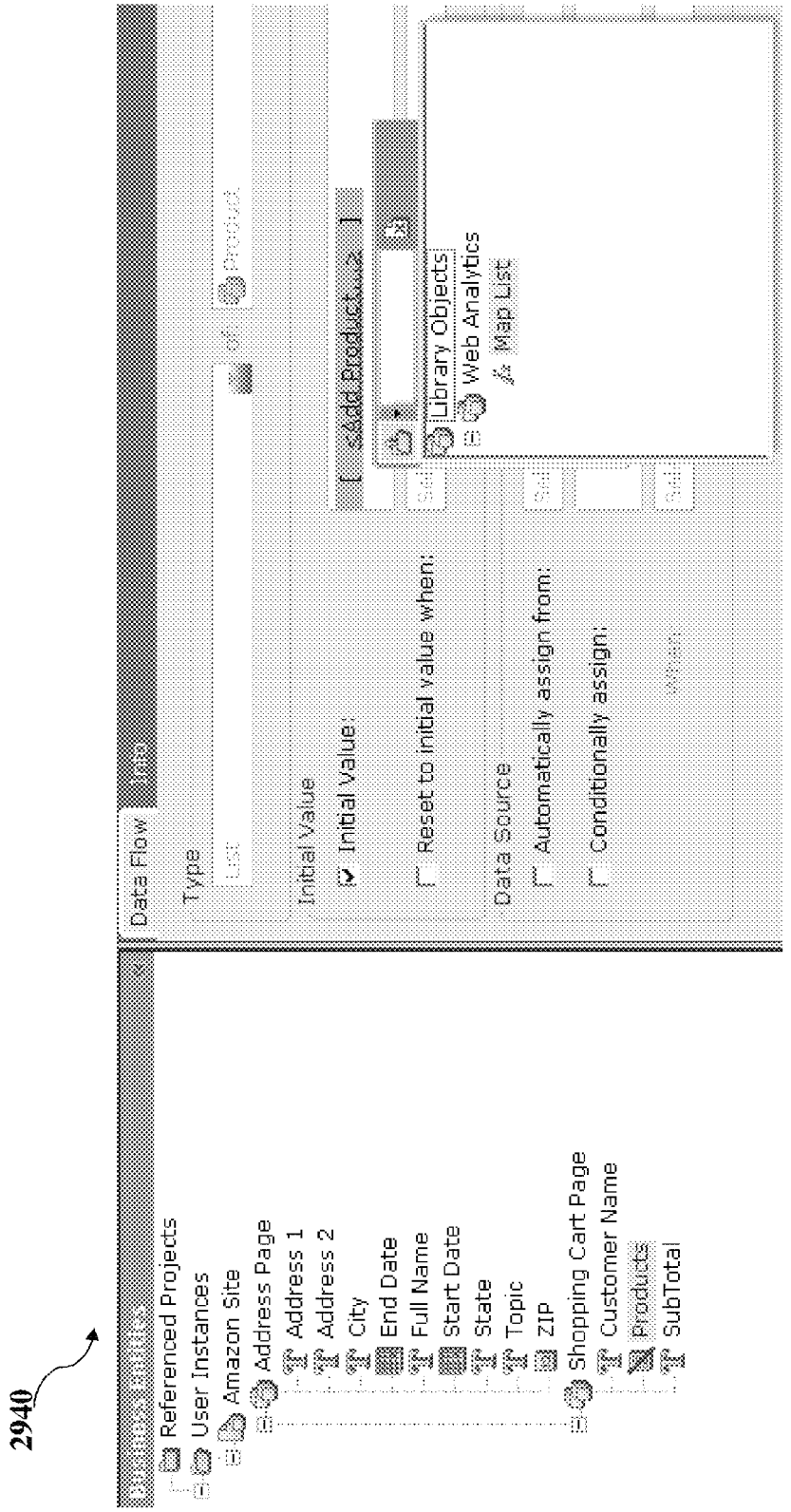

2940
Data Flow
Type
List
Product
Initial Value
Initial Value:
Add Product...
Reset to initial value when:
Data Source
Automatically assign from:
Conditionally assign:
Library Objects
Web Analytics
Map List
Referenced Projects
User Instances
Amazon Site
Address Page
Address 1
Address 2
City
End Date
Full Name
Start Date
State
Topic
ZIP
Shopping Cart Page
Customer Name
Products
SubTotal

Fig. 29Q

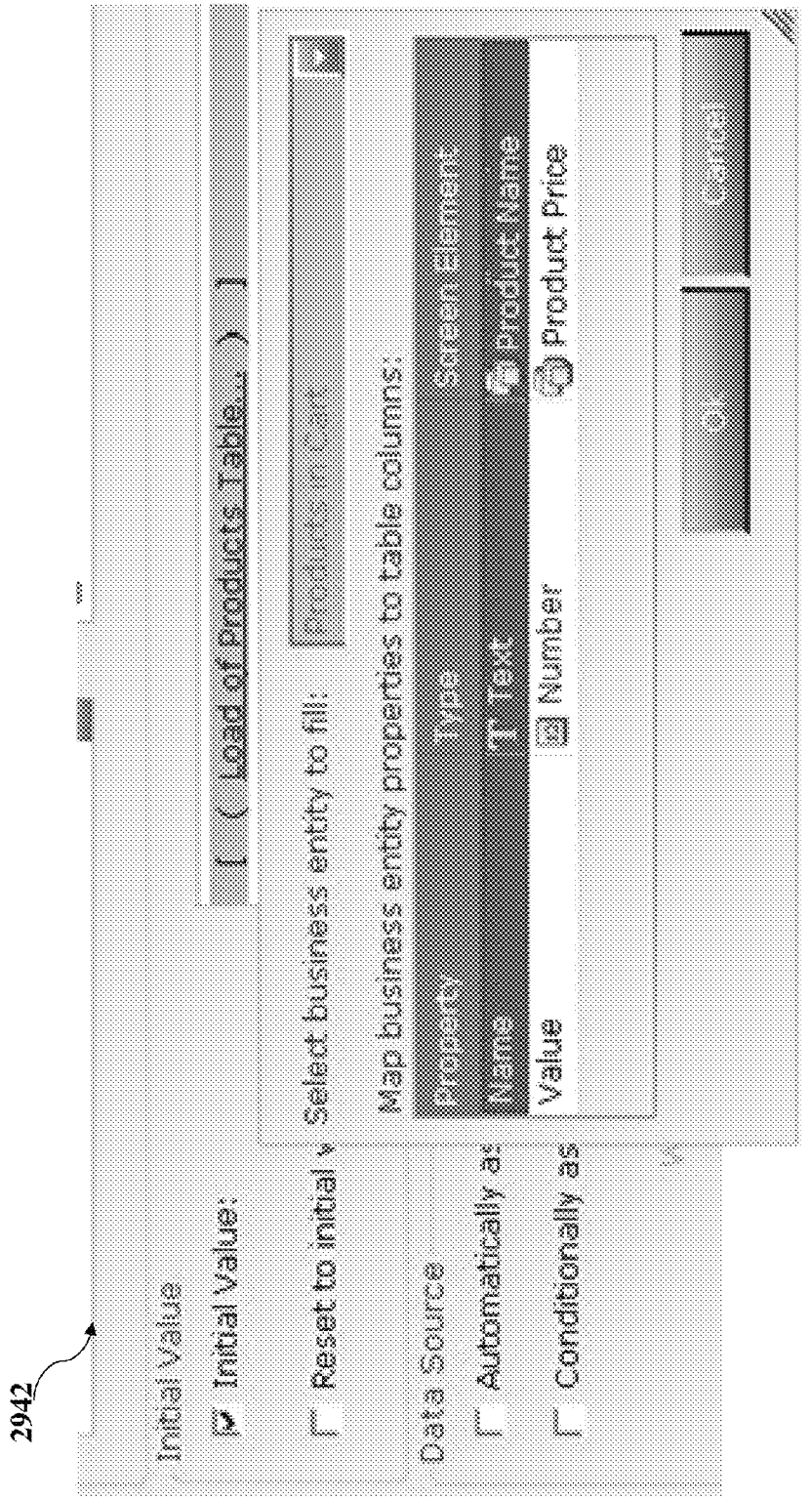

2942
Initial Value
Initial Value:
{ (Load of Products Table...) }
Reset to initial v
Select business entity to fill:
Map business entity properties to table columns:
Property
Name
Value
Type
T Text
Number
Screen Element
Product Name
Product Price
Data Source
Automatically as
Conditionally as
Cancel

Fig. 29R

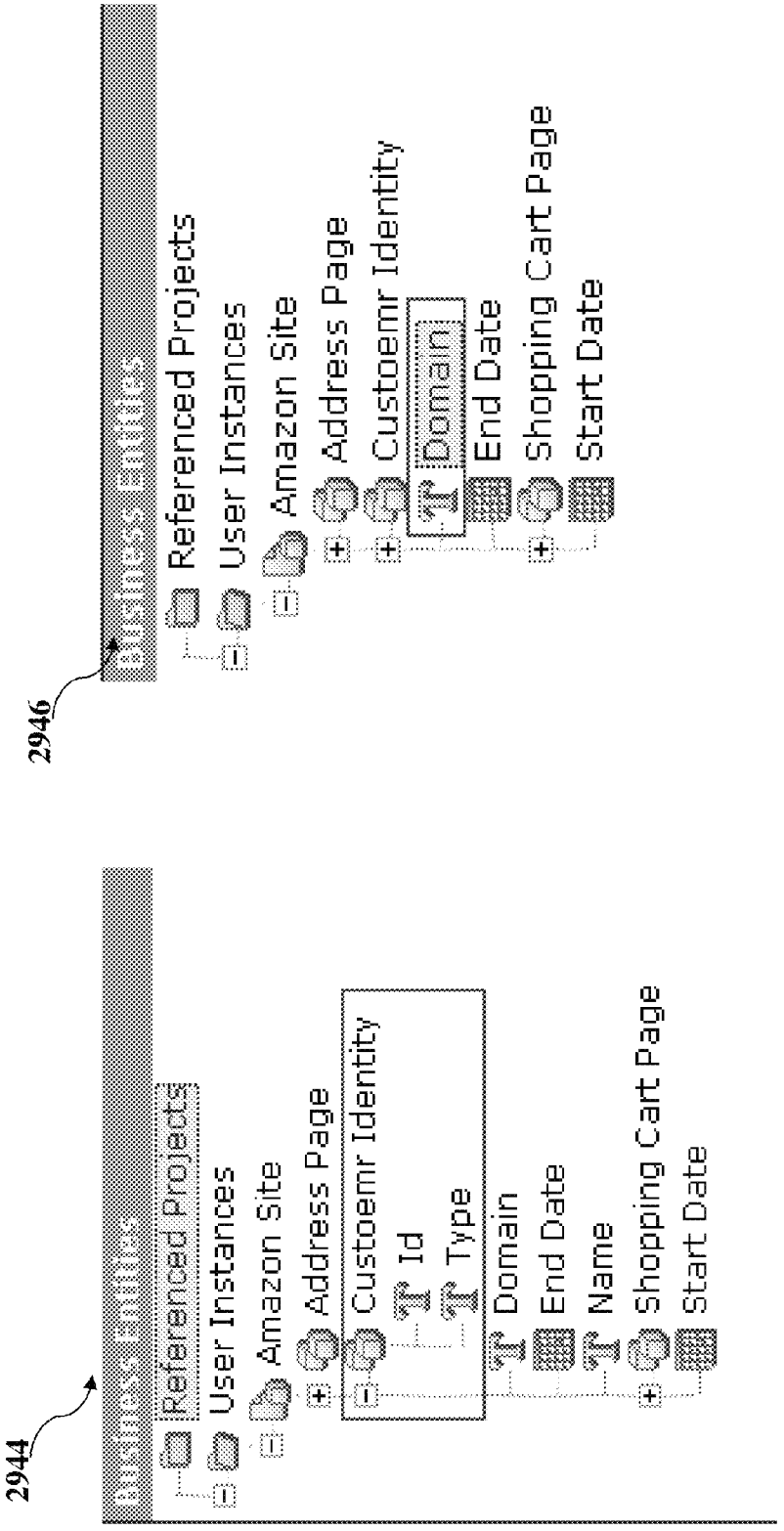

2944
Business Entities
Referenced Projects
User Instances
Amazon Site
Address Page
Customr Identity
Id
Type
Domain
End Date
Name
Shopping Cart Page
Start Date
2946
Business Entities
Referenced Projects
User Instances
Amazon Site
Address Page
Customr Identity
Domain
End Date
Shopping Cart Page
Start Date

Fig. 29S

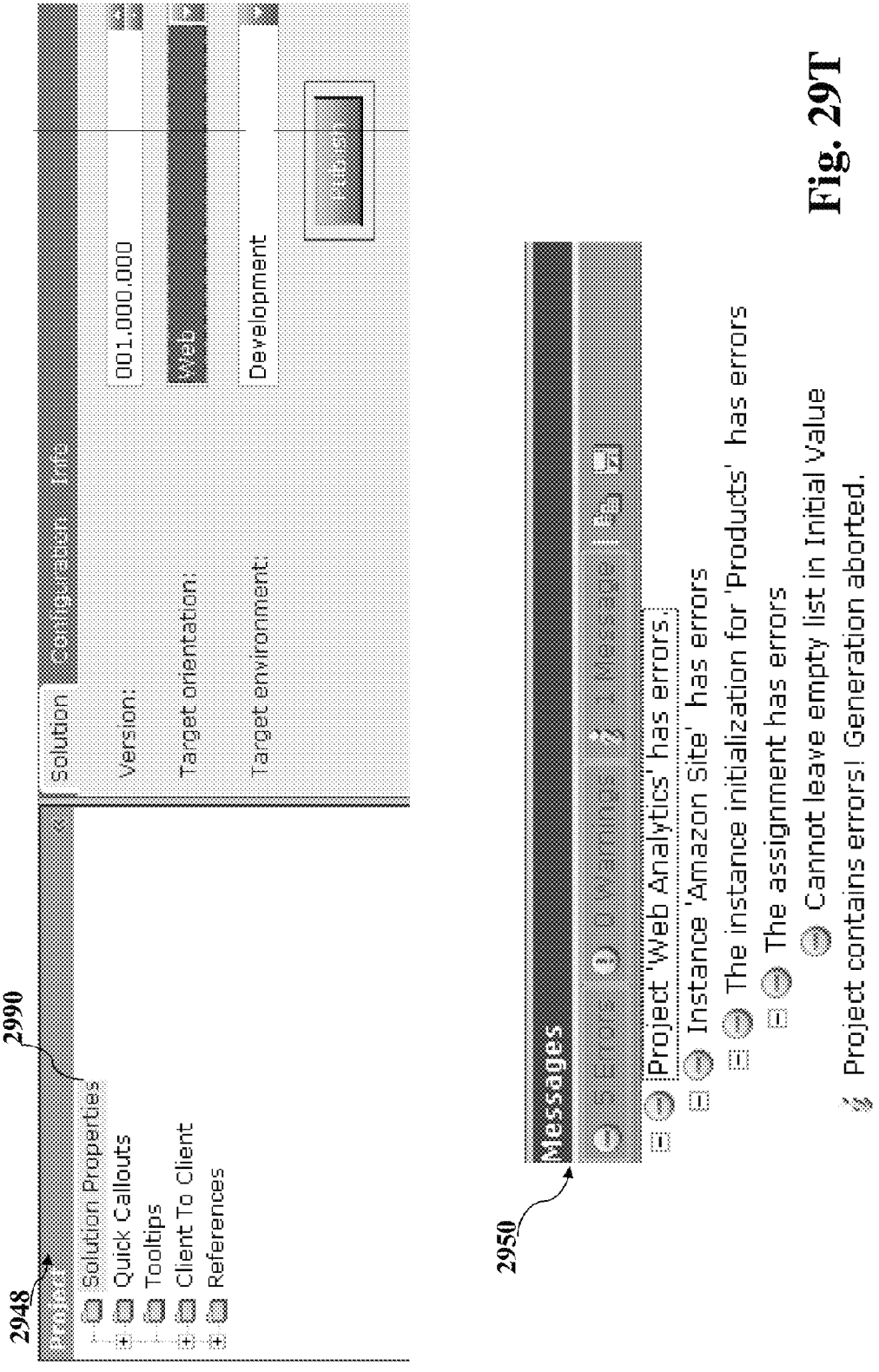

2990
2948
2950
Project
Solution Properties
Quick Callouts
Tooltips
Client To Client
References
Solution
Version:
Target orientation:
Target environment:
001.000.000
Development
Messages
Project 'Web Analytics' has errors
Instance 'Amazon Site' has errors
The instance initialization for 'Products' has errors
The assignment has errors
Cannot leave empty list in Initial Value
Project contains errors! Generation aborted.

Fig. 29T

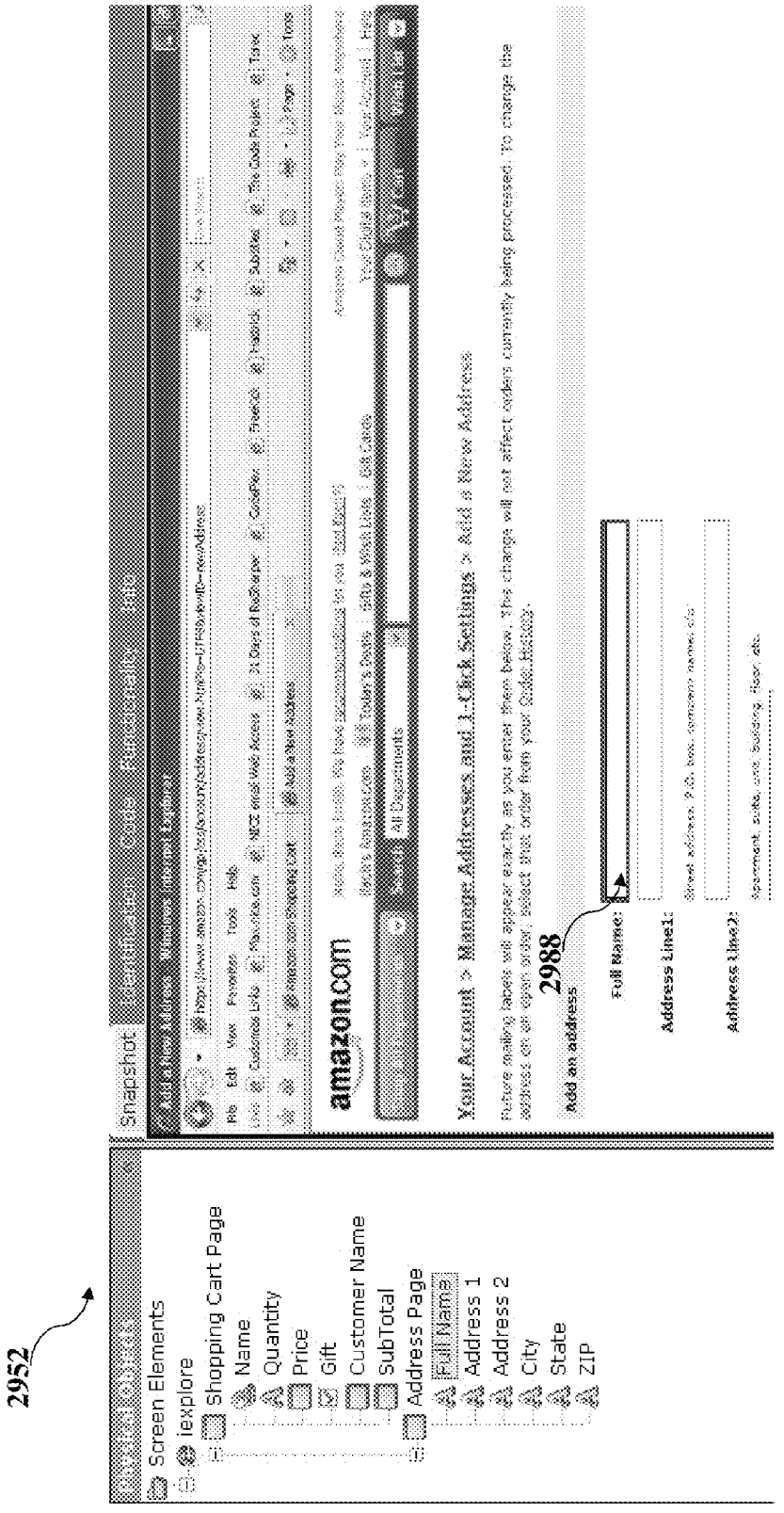

2952
Screen Elements
iexplore
Shopping Cart Page
Name
Quantity
Price
Gift
Customer Name
SubTotal
Address Page
Full Name
Address 1
Address 2
City
State
ZIP
Snapshot
amazon.com
Your Account > Manage Addresses and 1-Click Settings > Add a New Address
2988
Add an address
Full Name:
Address Line1:
Address Line2:

Fig. 29U

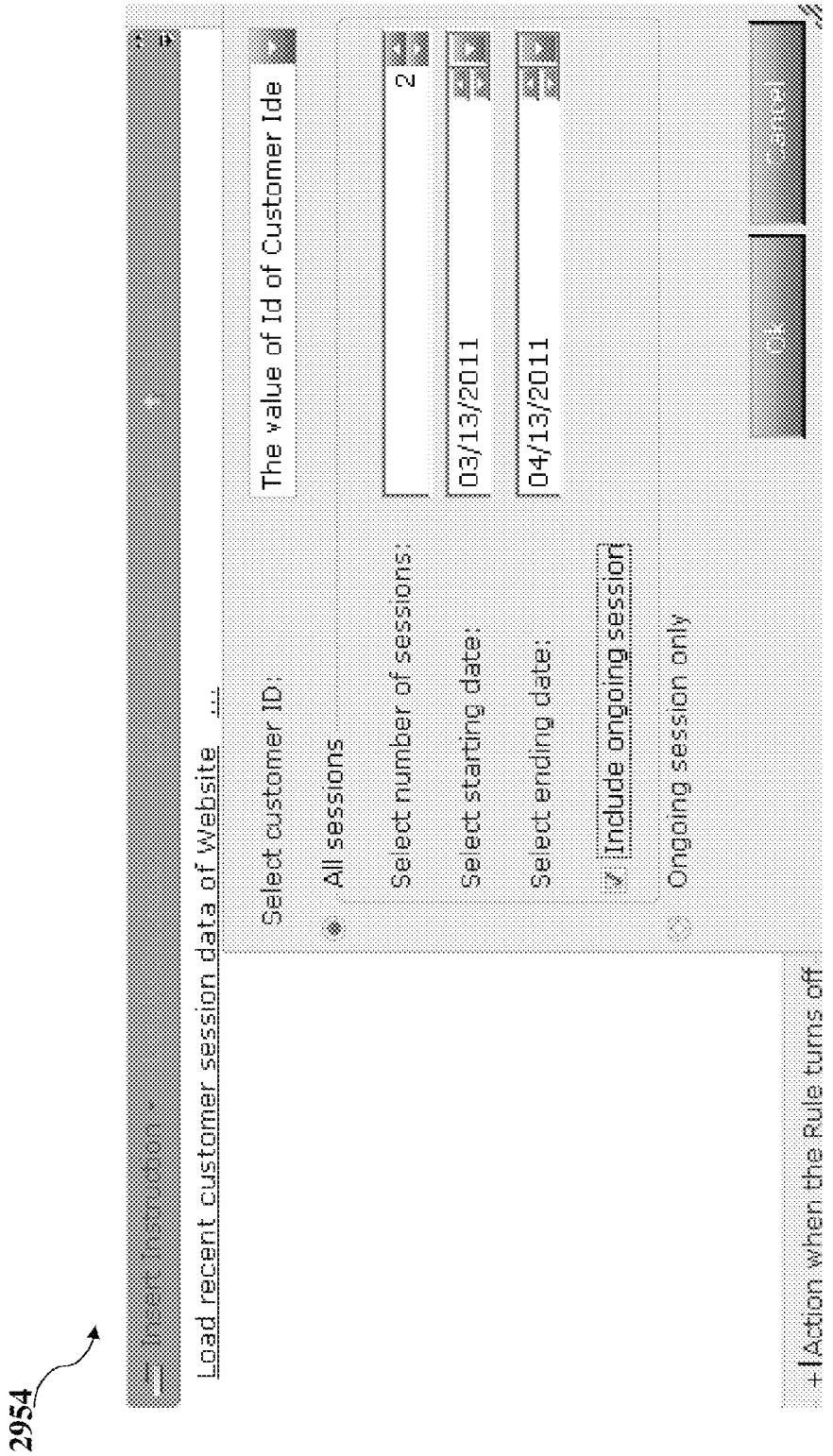

2954
Load recent customer session data of Website ...
Select customer ID:
The value of Id of Customer Ide
All sessions
Select number of sessions:
2
Select starting date:
03/13/2011
Select ending date:
04/13/2011
Include ongoing session
Ongoing session only
OK
Cancel
+ Action when the Rule turns off

Fig. 29V

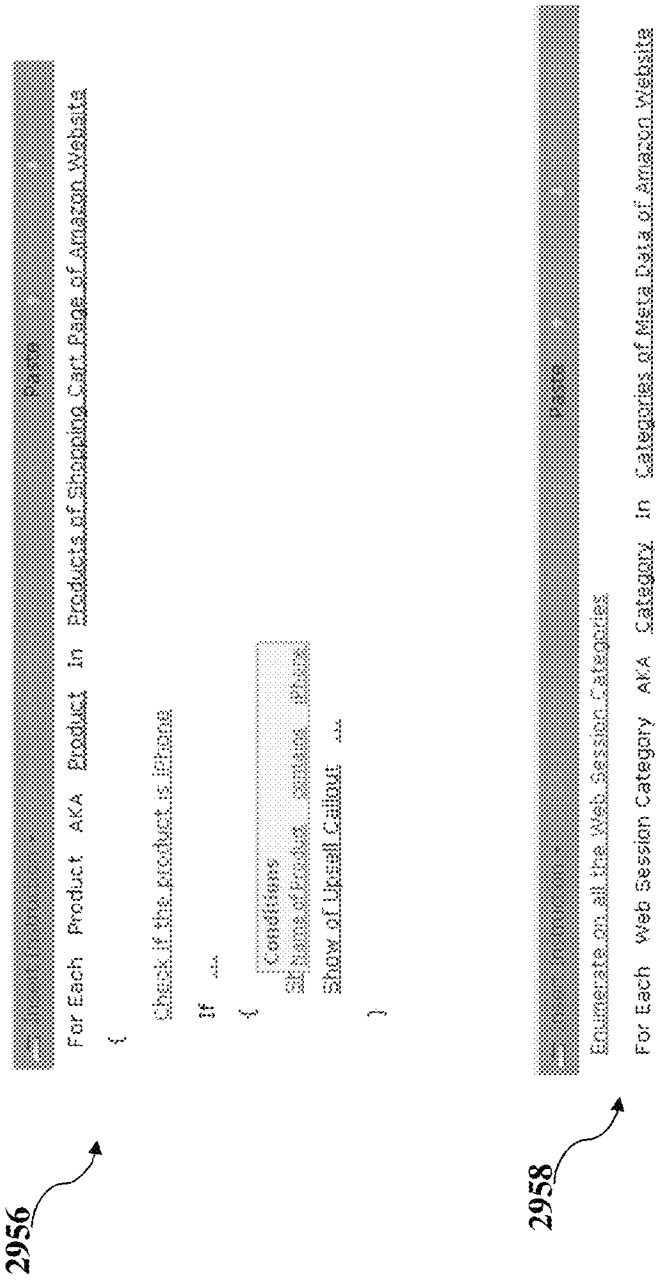

2956
For Each Product AKA Product In Products of Shopping Cart Page of Amazon Website
{
Check if the product is iPhone
If ...
{
Conditions
Show of Upsell Callout ...
}
2958
Enumerate on all the Web Session Categories
For Each Web Session Category AKA Category In Categories of Meta Data of Amazon Website
{
Check if the Extension category exists
If ...
{
Conditions
Show of Retention Callout ...
}

Fig. 29W

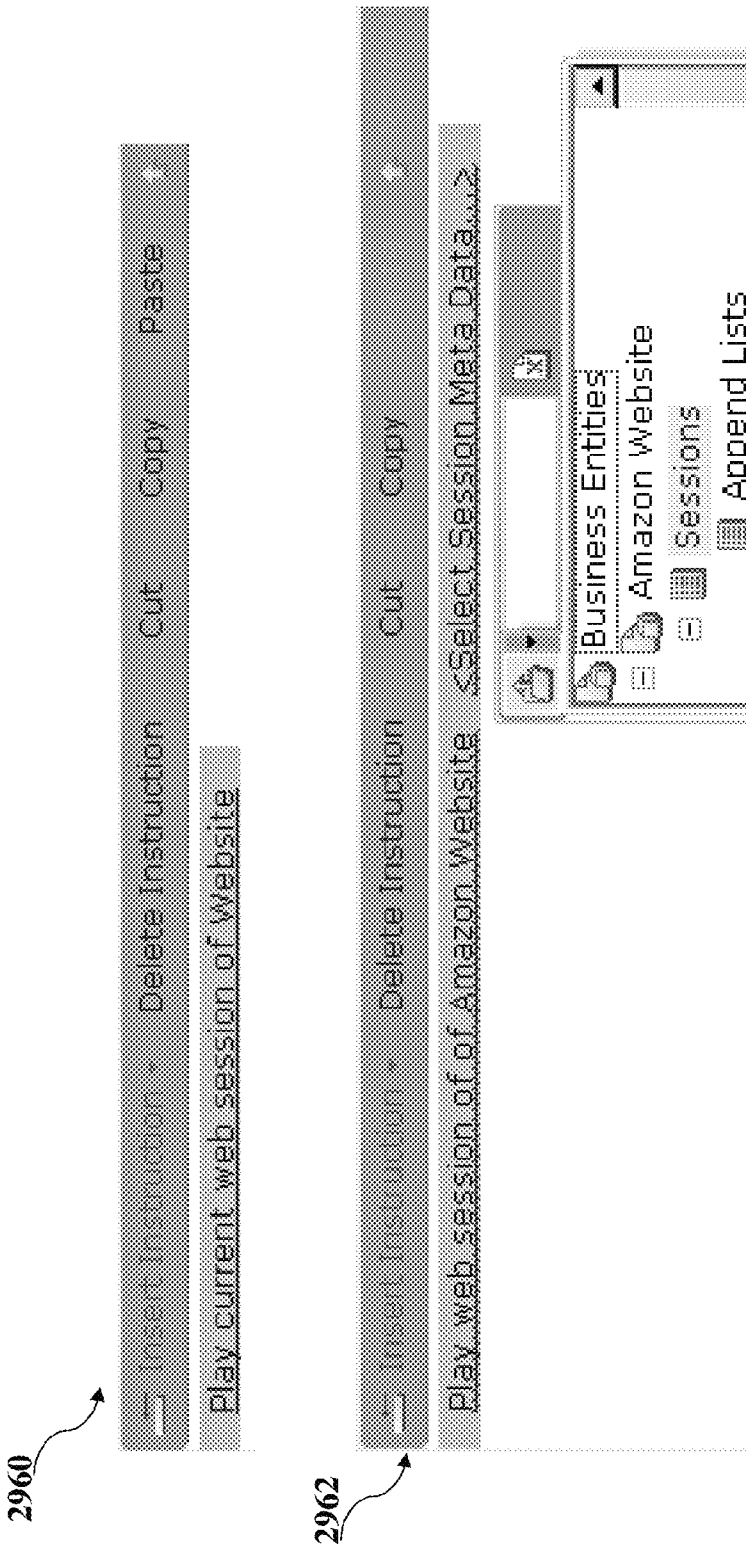

2960
Delete Instruction
Cut
Copy
Paste
Play current web session of Website
2962
Delete Instruction
Cut
Copy
Play web session of of Amazon Website <Select Session Meta Data...>
Business Entities
Amazon Website
Sessions
Append Lists

Fig. 29X

SYSTEM AND METHOD FOR TRACKING WEB INTERACTIONS WITH REAL TIME ANALYTICS

FIELD OF THE INVENTION

Embodiments of the invention relate to systems and methods for web or Internet traffic capture using passive sniffing, configuration and web elements capture, web elements extraction and analysis, session management, customer resolving, web content viewing and client notification based on the customer's web browsing.

BACKGROUND OF THE INVENTION

Company call centers or online support forums put customers in contact with company agents for customer service, for example, to provide technical support, sell products or schedule appointments. Customers are typically ordered in a queue and served on a first come first serve basis. Each customer is typically teamed up with or connected with the next available agent from a pool of agents in order to optimize service and provide the fastest agent response time. However, the customer may be matched with a new agent each time the customer contacts a support center. Such variation in agents may be frustrating for customers who may have to repeat information for each new agent and may also be inefficient for the agents who may have to be updated on issues already resolved by previous agents.

Further variability may be introduced when customers use multiple different channels of communication, such as the Internet and call centers, for customer service. For example, customers often shop online (using one channel of communication to research products), but buy over the phone (using another channel of communication to purchase products). However, if a customer contacts a call center after extensive Internet research, for example, to make a final purchase over the telephone, the call center agent has no information about the customer's Internet sessions. That is, agents contacted via one channel may have no way to track a customer's history across another channel. Therefore, agents remain uninformed or depend on the customer to report their history, a slow and unreliable process.

SUMMARY OF THE INVENTION

A device, system and method is provided for monitoring a user's interactions with Internet-based programs or documents. Content may be extracted from Internet server traffic according to predefined rules. Extracted content may be associated with a user's Internet interaction. The user's Internet interaction may be stored and indexed. The user's Internet interaction may be analyzed to generate a recommendation provided to a contact center agent while the contact center agent is communicating with said user, e.g., in real-time, for guiding the user's Internet interaction. Traffic other than Internet server traffic may also be used.

BRIEF DESCRIPTION OF THE DRAWINGS

The subject matter regarded as the invention is particularly pointed out and distinctly claimed in the concluding portion of the specification. The invention, however, both as to organization and method of operation, together with objects, features, and advantages thereof, may best be understood by reference to the following detailed description when read with the accompanying drawings in which:

FIG. **1** schematically illustrates a system for monitoring a user's web or cross-channel interactions in accordance with an embodiment of the invention;

FIG. **2** schematically illustrates an interface provided to a customer agent in accordance with an embodiment of the invention;

FIG. **3** schematically illustrates a cross-channel analytics workflow in accordance with an embodiment of the invention;

FIG. **4** schematically illustrates a system for monitoring a user's web interactions in accordance with an embodiment of the invention;

FIG. **5** schematically illustrates a system including a web analyzer in accordance with an embodiment of the invention;

FIG. **6** schematically illustrates an interface between a web analyzer and a connection server in accordance with an embodiment of the invention;

FIG. **7** schematically illustrates a system including a web analyzer and a connection server interacting via a connection service interface in accordance with an embodiment of the invention;

FIG. **8** schematically illustrates a workflow for retrieving open sessions in accordance with an embodiment of the invention;

FIG. **9** schematically illustrates a sessions structure manager in accordance with an embodiment of the invention;

FIG. **10** schematically illustrates a path to locate elements to be extracted from a document in accordance with an embodiment of the invention;

FIG. **11** schematically illustrates an example of a webpage with extracted screen elements defined by the paths of FIG. **10** in accordance with an embodiment of the invention;

FIG. **12** schematically illustrates a system for capturing a user's web interactions in accordance with an embodiment of the invention;

FIG. **13** schematically illustrates the components of the system of FIG. **12** in accordance with an embodiment of the invention;

FIGS. **14**A-**14**C schematically illustrate interfaces for configuring a rule scheduler in accordance with an embodiment of the invention;

FIG. **15** schematically illustrates an interface for configuring session authentication parameters in accordance with an embodiment of the invention;

FIGS. **16**A-**16**B schematically illustrate playback interfaces for viewing user web sessions in accordance with an embodiment of the invention;

FIG. **17** schematically illustrates a system for providing real-time guidance in accordance with an embodiment of the invention;

FIG. **18** schematically illustrates a system for recording a user's web interactions in accordance with an embodiment of the invention;

FIG. **19** schematically illustrates a system for archiving a user's web interactions in accordance with an embodiment of the invention;

FIG. **20** schematically illustrates a system for playback of non-archived web interactions in accordance with embodiments of the invention;

FIG. **21** schematically illustrates a system for playback of archived web interactions in accordance with embodiments of the invention;

FIG. **22** schematically illustrates a system for shadow browsing a user's web interactions in accordance with embodiments of the invention;

FIG. **23** schematically illustrates a system for an agent to provide real-time guidance in accordance with embodiments of the invention;

FIG. **24** schematically illustrates a system integrating a third-party customer experience management (CEM) server in accordance with embodiments of the invention;

FIG. **25** schematically illustrates a system having an integrated third-party CEM server retrieving a plurality of offline web sessions in accordance with embodiments of the invention;

FIG. **26** schematically illustrates a system for playback of the offline web interactions retrieved in FIG. **25** in accordance with embodiments of the invention;

FIG. **27** schematically illustrates a system for defining the specific data items to monitor in a user's web interactions in accordance with embodiments of the invention;

FIGS. **28**A and **28**B schematically illustrate file directories to access data items monitored in a user's web interaction in accordance with embodiments of the invention; and

FIGS. **29**A-**29**X schematically illustrate interfaces for configuring web analytics solutions in accordance with an embodiment of the invention.

It will be appreciated that for simplicity and clarity of illustration, elements shown in the figures have not necessarily been drawn to scale. For example, the dimensions of some of the elements may be exaggerated relative to other elements for clarity. Further, where considered appropriate, reference numerals may be repeated among the figures to indicate corresponding or analogous elements.

DETAILED DESCRIPTION OF THE INVENTION

In the following description, various aspects of the present invention will be described. For purposes of explanation, specific configurations and details are set forth in order to provide a thorough understanding of the present invention. However, it will also be apparent to one skilled in the art that the present invention may be practiced without the specific details presented herein. Furthermore, well known features may be omitted or simplified in order not to obscure the present invention.

Unless specifically stated otherwise, as apparent from the following discussions, it is appreciated that throughout the specification discussions utilizing terms such as "processing," "computing," "calculating," "determining," or the like, refer to the action and/or processes of a computer or computing system, or similar electronic computing device, that manipulates and/or transforms data represented as physical, such as electronic, quantities within the computing system's registers and/or memories into other data similarly represented as physical quantities within the computing system's memories, registers or other such information storage, transmission or display devices.

When used herein, a telephone call may include devices and networks beyond the "plain old telephone system" (POTS), such as VOIP telephone calls using personal computers. "Calling" in the context of a person taking action may including using a traditional telephone or other device such as a VOIP telephone, cellular telephone, or other device, to speak with another person. Further, embodiments of the invention may allow for a user to contact an agent via other methods, such as on-line chat. "Calling" in the context of a process or processor taking action may mean, for example, executing a software process, requesting a software process perform some function or return some result, etc.

Overview

Embodiments of the invention provide a system and method for tracking and analyzing interactions of each customer over the World Wide Web ("web") including the Internet and/or an Intranet (when used herein, the web may be used interchangeably with the Internet and/or Intranet, as web is a system of interlinked hypertext documents accessed via the Internet and/or Intranet). For example, each time a user or customer interacts with the web or Internet, for example, selecting a search term, "browsing" or accessing a webpage, viewing a product description via the Internet, etc., such interactions may be recorded. Data may be extracted from each web interaction, for example, according to, matching or corresponding to a set of predefined parameters, features or rules for tracking web interactions, such as, the amount of time a webpage was viewed, a number of times or which different items are selected on a webpage, the order in which the webpage was viewed, the number of repeated viewings over a time span, the presence or frequency of certain key-words, etc. The predefined extracted features may be fixed or designed by a company support team or process optimization (PO) designer and may be adapted on a session-by-session basis. Capturing and extracting web content features may be executed using a passive or server-side web browser sniffer or capture device. A user's interaction with the web or with the Internet may include remote access of web documents, interaction with remote programs via the Internet, interaction with other users or institutions via interaction with remote programs via the Internet, etc.

Embodiments of the invention may analyze interactions and extract web content for each customer or user to build one or more session summaries. A session may include a series of interactions executed by a customer, for example, ending when the customer logs off, closes the browser used for viewing, completes a transaction, or finishes viewing a document. A session may end, for example, after a predetermined session duration of time, after customer inactivity for a predetermined time, or after a maximum number of interactions. Embodiments of the invention provide a session summary which may include, for example, a description of the customer's interactions including title of webpage(s), webpage universal resource locator (URL), date/time webpage(s) created, product(s) viewed, prices offered, product categories (used vs. new, wholesale vs. retail, etc.), customer search words, customer highlighting or selection of products, etc.

Customer interactions may be tracked using "cross-channel" analysis, e.g., across multiple channels of communication. For example, a web summary of a user's online (e.g., Internet or web) session may be retrieved upon receipt of an incoming call from the same user or when initiating a call session to the same user. Similarly, a call summary of a user's call center session may be retrieved upon the user initiating an online customer service session. In general, an agent providing support to a user may retrieve summaries for all sessions across all communication channels or a subset of a session, for example, within a specified time period, conducted over specific communication channels (such as, only web interactions or only call center interactions), relevant to the current session topic (such as, including key-words in the extracted data that match key-words of the current session), etc. Web browsing on a user's private computer may be captured or recorded by using passive sniffing devices, probes or other capturing modules. The capturing modules may be initiated automatically or after gaining permission from the user. The agent or the support program designer may select which session summaries to review. In some embodiments, a list of session summaries may be provided for selection to an agent that may be ordered according to session relevance, for example, based on the frequency and/or number of matching key-words in the session compared to the current session.

In some embodiments, each live agent may be provided with an automated agent, for example, to prompt the live agent with dialogue, strategies to resolve issues, and other instructions or recommendations for interacting with a user. The automated agent recommendations may be based on the user's cumulative single-channel or cross-channel web and/or call center history. Such embodiments may provide a semi-live/semi-automated agent by providing the live agent with automated tasks. The automated information may include, not only the current customer's history, but also one or more corresponding ideal session histories or summaries for comparison, for example, to predict optimal future session paths to recommend to the customer. The ideal histories may be based on real-life session summaries generated by other satisfied customers or may be modeled sessions generated in a computer-training environment by a computer programmer or trainer. The ideal session histories may be retrieved from a pool of session histories that most closely matches the topics, key-works and/or other features used in the current customer's session. The ideal session histories may be fixed, e.g., including a linear path of webpages to browse, or dynamic, e.g., including tree-structured or matrix paths, where each chosen webpage path leads to different options, and thus different outcomes.

Customer interactions may be tracked in real-time, for example, while the contact center agent is communicating with the user or during or concurrently with the customer interactions or at a small time delay thereafter (e.g., on the order or a few second or milliseconds).

Agents may include real-life interactive personnel, automated computer agents, avatars, voice or text prompts, etc., or a combination semi-live/semi-automated agent. In one embodiment, an automated agent may track a user's session in real-time and/or provide recommendations, for example, from a recommendations database, that may be linked to conditions detected in the user's session. The recommendations may be sent to the agent in real-time or while the contact center agent is communicating with the user, for example, using a telephone, Internet or other user-agent connection. In another embodiment, an automated agent may use one or more ideal session histories, where for each customer webpage interaction, the automated agent may recommend or re-direct (upon user verification) the customer to the next optimal predicted webpage or interaction defined by the ideal session histories.

Embodiments of the invention provides systems and methods for "recording" or tracking customer-specific and/or session-specific web activity, for example, by capturing Hypertext Markup Language (HTML) web traffic data (e.g., representing user interactions across the Internet with remote documents or programs), extracting information from the data, and filtering, extracting or saving relevant information for analysis and playback. The data may describe the cross-channel customer behavior of the customer and may be used to discern the behavior of customer groups across the different channels in order to optimize channel usage. The analyzed data for a customer may be provided to an agent serving or communicating with the customer. The agent may be connected to the customer via for example a telephone call center (which may include a telephone call via a computer) and may receive the customer's web session data. In some embodiments, the customer's web session data may define the customer's past web interactions. The agent may receive a real-time guidance message (e.g., generated by a PO Client), notifying the agent that the customer has interacted with the web server in the past. The real-time guidance message may offer up-sell or cross-sell options, for example, according to the analysis of the web interaction and business rules in a recommendations database. The real-time guidance message may also offer to play back past web interaction. In some embodiments, the customer's web session data may define the customer's current or ongoing web interactions. For example, a customer interacting with an agent may have been or may begin interacting with a web server, for example, with or without the agent's knowledge or according to the agent's instructions. The agent may receive a real-time guidance message (e.g., generated by the PO Client), notifying the agent that the customer is interacting with the web server. The real-time guidance message may offer to "shadow browse" the customer, for example, simulating the customer's web session for the agent to view. Embodiments of the invention may be used for technical support, selling, "up-selling" or "cross-selling," filling in surveys, etc., although other applications may be used.

System Configuration

Reference is made to FIG. **1**, which schematically illustrates a system **100** for monitoring a user's web or cross-channel interactions in accordance with an embodiment of the invention.

System **100** may include one or more user computers **102** for interacting over the web (e.g. via the Internet), one or more web servers **122** for hosting or distributing information over the web (e.g. via the Internet), one or more web capture servers **110**, analysis servers **116** and/or storage centers **118** for monitoring user's interactions with Internet-based programs or documents. System **100** may also include one or more additional user devices **108**, such as telephone, SMS message or text enabled devices, for the user to interact over another network, such as, a telephone or messaging network. User computers **102** may include for example web browsing software to enable a user to access remote websites via the Internet.

User computer **102**, e.g., controlled by a user, may access documents, websites and web pages provided by web servers **122** via a network **140**, such as the web or Internet. Web servers **122** may include applications for retrieving and viewing web content on user computer **102**. In one embodiment, the user may be a customer browsing webpages, which are supported by web servers **122**. Web capture servers **110** may record, copy, or capture user traffic on web servers **122**, for example, using a passive sniffing device or other device (e.g., probe **410** of FIG. **4**). An interactions center **124** may be responsible for recording and managing rules, monitoring and scheduling telephone or web-connections and populating a database **126** with user interaction data. Interactions center **124** may be installed on a dedicated server. In one embodiment, analysis server **116** and interactions center **124** may be installed on the same server.

A client installed on agent device **120** (e.g., PO client **420** of FIG. **4**) may identify "interesting" or significant content, interactions or information exchanged with Internet accessible programs, documents or webpages from the captured traffic that satisfies, corresponds to or matches predefined rules or criteria. Interesting content may be defined (e.g., by a client at agent device **120**, such as, PO client **420** of FIG. **4**), for example, as content or information which conforms to or passes certain rules or criteria, is matched to certain patterns, or by other criteria. For example, the rules or criteria may define the web elements to be extracted and/or the webpages or websites from which the data elements may be extracted. In one embodiment, the rules or criteria may be generated by an agent or system designer (e.g., using a PO designer, such as,

PO designer **1706** of FIG. **17**), and may be uploaded via the agent client to analysis servers **116** to extract the data elements from the web traffic according to those rules.

The client at agent device **120** may request the interesting information, for example, including information from closed (past) web sessions from database **126** (e.g., via server **424** of FIG. **4**) and information from open (ongoing) web sessions from analysis server **116**.

Analysis server **116** may extract metadata, embedded tags, URLs or other information attached to recorded, copied, or captured webpages or websites for ongoing or current web sessions. Analysis server **116** may identify which user executed those interactions and may attach user profile data, user identification codes or other user-related data to the extracted or saved interaction content or documents. In this manner or other manners content or interactions may be associated with or linked to a user or customer. Analysis server **116** may compile or assemble each user's associated content to generate a summary of the user's web-interaction history, for example, which may be sent in real-time to the agent client. Analysis server **116** may analyze, edit, and index the extracted or saved interaction content, for example, to create an organized and uniform repository of user histories, e.g., in database **126**, that may be easily accessed by customer service agents. In some embodiments, analysis server **116** may assign indicators or categories to interactions, for example, such as, the user that executes the interaction, topics or keywords in the interaction (e.g., product X, service Y, financial/billing issues, etc.), the channel of communication for the interaction (e.g., web, telephone, messaging, in person, etc.) and/or the time of the interaction (e.g., the exact time of the interaction, if the interaction occurred in the past hour/day/month/year, the time difference since the previous interaction for the same topic, etc.). Analysis server **116** may determine which user interactions are relevant to the current issue by matching their identifiers to relevancy criteria received from the agent client. For example, analysis server **116** may retrieve all interactions for a specific user, on a specific topic, in any communication channel within the past hour. The relevancy criterion for selecting interactions may be predefined, statistically computed to generate a predetermined number of interactions or "hits," or selected by the agent.

Users may be connected via user computers **102** (for web connections) and/or user devices **108** (for other network connections) with live or automated agents at agent devices **120**. Agents may provide users with customer support, conduct transactions for purchasing products or services, fill out surveys, or provide other products or services. Agent devices **120** may be connected to database **126** storing information related to users' interaction histories over the web and/or other networks. When an agent is connected to a user, the agent may automatically or, after sending a request, gain access to the user's interaction history. Database **126** may also store recommendations for users. Agent devices **120** may automatically retrieve the recommendations from database **126** having a predefined correlation with the user with which the agent is currently communicating. The recommendations may be communicated automatically while the agent is communicating with the user, for example, via an automated agent or to prompt a live agent to manually communicate the recommendations to the user. Agents may be guided through user interactions and prompted with recommendations or scripts, for example, to standardize and optimize agent support.

In some embodiments, agent devices **120** may "shadow-browse" a user computer, for example, providing agent devices **120** with real-time playback of user computer **102** interactions so that the agent may monitor or guide user interactions in real time. The playback may include a simulated screen-shot of user computer **102**, a table or control panel listing interaction details, such as, URLs, product descriptions, user commands, etc., and/or a user interaction summary. In some embodiments, analysis server **116** may provide "channel containment" analysis, for example, describing the reasons that users switch from one communication channel (e.g., Internet) to another (e.g., telephone). Channel containment analysis may allow a company to use the identified problems in each channel to improve customer support (e.g., by re-designing web pages, providing more information on each channel) to keep more customers in their original channel (e.g., Internet). Analysis server **116** and/or interactions center **124** may track end-to-end first contact resolution, for example, to determine if a user's problem or issue is resolved completely (from end-to-end) within a first contact with an agent device **120**, or if the user does not resolve their issue or is transferred or re-connected multiple times to one or more support channels to resolve their issue. Analysis server **116** may provide "chum prediction," for example, where by analyzing one or more (e.g., Internet or cellular telephone) interactions, the center may predict whether or not a company or service provider is at risk of losing its customer.

User computer **102** and agent device **120** may be personal computers, desktop computers, mobile computers, laptop computers, and notebook computers or any other suitable device such as a cellular telephone, personal digital assistant (PDA), video game console, etc., and may include wired or wireless connections or modems. Although user computer **102** and agent device **120** are described to be computer devices with a web connection, they may alternatively be telephone or messaging devices or a combination of telephone, messaging and/or computer, for example, so that the agent and user may interact via multiple communication networks. User computer **102** and agent device **120** may include one or more input devices, for receiving input from a user or agent (e.g., via a pointing device, click-wheel or mouse, keys, touch screen, recorder/microphone, other input components) and output devices **105** and **125** (e.g., a monitor or screen) for displaying data to a user and agent, respectively.

User computer **102**, web capture server **110**, analysis server **116**, agent device **120** web servers **122** and interactions center **124**, may each include one or more controller(s) or processor(s) **106**, **112**, **132**, **136**, **128**, and **142**, respectively, for executing operations and one or more memory unit(s) **104**, **114**, **134**, **138**, **130** and **144**, respectively, for storing data and/or instructions (e.g., software) executable by a processor. Processor(s) **106**, **112**, **132**, **128**, **136** and **142** may include, for example, a central processing unit (CPU), a digital signal processor (DSP), a microprocessor, a controller, a chip, a microchip, an integrated circuit (IC), or any other suitable multi-purpose or specific processor or controller. Memory unit(s) **104**, **114**, **134**, **138**, **130** and **144** may include, for example, a random access memory (RAM), a dynamic RAM (DRAM), a flash memory, a volatile memory, a non-volatile memory, a cache memory, a buffer, a short term memory unit, a long term memory unit, or other suitable memory units or storage units.

Web capture server **110**, analysis server **116**, storage centers **118**, agent device **120**, and interactions center **124**, may each be, for example, software executed on one or more processors, and while this software may be in one processing device or server, it is not necessarily executed by the same processor or within the same computing device.

Agent Interface

Reference is made to FIG. **2**, which schematically illustrates an interface **200** provided to a customer agent in accordance with an embodiment of the invention.

Interface **200** may be a prompt or an "automated agent" provided to a live agent via a device (e.g., agent device **120** FIG. **1**). Interface **200** may display a summary **202** of a history of a current customer's one or more relevant or interesting web or cross-channel interactions. Relevant or interesting interactions may be determined by rule matching or matching identifiers, in which the interactions are selected that are assigned identifiers (e.g., topic, time, product, etc.) that match identifiers associated with the current interaction or that match key-words entered by the agent. The summary of the customer's interactions may include a description of the customer activity and/or details **204** of the matching interaction, for example, product or service details. Interface **200** may also display one or more recommendation(s) **206** for the agent to communicate with the user, for example, to provide technical support, offer deals, or up-sell the same or similar product or service. Interface **200** may also include a customer response field **208** to register the customer's response to the agent recommendations. Interface **200** may update the recommendations based on the customer response, for example, automatically or when requested by the agent, to provide alternative recommendations if the response was negative or similar recommendations if the response was positive (or tentative). Interface **200** may include agent options **210**, such as, "rebuttal" to retrieve an automated rebuttal to customer inquiries, "follow-up" to register a follow-up interaction with the customer to reiterate the current interaction or sale offer, "send Info" to automatically send sale or interaction details to the user at a registered contact point (e.g., via email, text or telephone) or "playback" to play the customer's current or previous relevant web interaction for the agent. Other fields and interfaces may be displayed.

Interface **200** may be displayed to an agent, for example, as a dedicated window, an embedded window (e.g., using a customer relationship management (CRM) system), a pop-up window, a webpage, an application page, and/or any combination or variation thereof.

Cross-Channel Workflow

Reference is made to FIG. **3**, which schematically illustrates a cross-channel analytics workflow **300** in accordance with an embodiment of the invention. Workflow **300** may be executed at interactions center **124** (to manage rules for monitoring agent-user interactions), analysis server **116** (to extract the data according to the rules), a PO client (to enable real-time guidance) of FIG. **1**. Workflow **300** may include cross-channel sequencing **302**, trend analysis **304**, root cause analysis **306** and/or impact reporting **308**.

Cross-channel sequencing **302** may sequence or index customer cross-channel interactions, for example, according to topics, key-words, communication channel, time, etc., to create an organized and uniform database of customer interactions that may be easily searched to detect relevant interactions.

Trend analysis **304** may include generating sequence distribution reports, sequence trend analysis, segment analysis, channel deflection analysis, key performance indicators (KPIs) and/or alerts.

Root cause analysis **306** may identify a probable root cause of channel-deflection, in which the user switches from one communication channel to another, for example, calling a contact center after viewing the company web site. Root cause analysis **306** may also include agent comparison analysis and/or customer segment analysis.

Impact reporting **308** may include automatically generating marketing, business or technology reports, coaching agents by providing immediate automated tips or by providing follow-up training sessions specifically targeted to improve the agent's areas of weakness, and real-time guidance by providing a real-time prompt or recommendations to agents while they serve or communicate with a customer (e.g., via interface **200** of FIG. **2**).

Trend analysis **304**, root cause analysis **306**, and impact reporting **308** may each be, for example, software executed on one or more processors, which may or may not be located in the same computing device.

System Components

Reference is made to FIG. **4**, which schematically illustrates a system **400** for monitoring a user's web interactions in accordance with an embodiment of the invention. Components and processes of FIG. **4** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, and interactions center **124** and their processors **112**, **132**, **136** and **142**.

System **400** may include a web server **402** (e.g., web server **122** of FIG. **1**) providing web content or documents (e.g., interactions with programs, documents, or users accessed via the Internet) and a switch **404** for user computers **406** (e.g., user computers **102** of FIG. **1**) to connect and interact with web server **402**. System **400** may include a network interface card (NIC) **408** to connect a probe **410** to switch **404**. Probe **410** may monitor user computers' **406** web interactions, for example, by recording, copying, passively sniffing or capturing web pages, scripts and any other web content according to capture criteria. Probe **410** may execute a targeted search of interactions, for example, in a user or kernel operating system (OS) modes. Probe **410** may transfer interactions data, for example, including packets of HTML pages and scripts, to internet processing server (IPS) **412**. IPS **412** may process the interactions packets and sort or extract targeted information, for example, into page data and/or metadata (e.g., URLs, cookies, etc.). Switch **404**, NIC **408**, probe **410** and/or IPS **412** may be components of or connected to one or more capture servers (e.g., capture servers **110** of FIG. **1**) and may be operated by one or more processors **112** thereof. A capture storage **414** (e.g., storage center **118** of FIG. **1**) may save the captured page data (e.g., in a storage hierarchy) and a capture database **416** (e.g., database **126** of FIG. **1**) may save the captured metadata, although other or additional data elements may also be saved.

A web analyzer **418** (e.g., analysis server **116** of FIG. **1**) may retrieve data from capture storage **414** and/or capture database **416** and may analyze the data, identify, filter, save or extract interesting elements, such as, products and products prices, that satisfy, match or correspond to rules set by a rule manager **426** and create user sessions. Web analyzer **418** may automatically and passively determine the user identity of web interactions, for example, by passively sniffing metadata (e.g., cookies) or the web pages themselves. A "sniffer" or "packet analyzer" may refer to a device or executable software adapted to capture, intercept and/or log traffic passing over a digital network, such as, the Internet. "Passive" may refer to an act, such as, sniffing, executed independently of the act. For example, a passive sniffer may intercept and record network traffic independently or separately from the network traffic users (e.g., user computers **406**) and providers (e.g.,

web server **402**). Web analyzer **418** may also automatically and passively divide the interactions into distinct user sessions for an agent device **430** (e.g., agent device **120** FIG. **1**), for example, via a PO client **420**. PO client **420** may determine when a previous session ends (e.g., when no user feedback is received for a predetermined period of time) and when a new session begins (e.g., when user feedback is received after a delay). PO client **420** may communicate with web analyzer **418** via a connection server **424**. PO client **420** may be installed on any device in system **400**, for example, including user computers **406**, agent devices **430** and/or web analyzer **418**.

User computers **406** interactions with web servers **402** may be recorded as data, such as, URLs of accessed web pages, metadata of accessed web pages, links selected, etc. PO client **420** may determine the rules for identifying or extracting information, such as, screen elements, metadata or other web objects, from the interaction data. Web analyzer **418** may store or save identified, filtered or extracted interaction data (e.g., which match or correspond to rules) in an interactions database **422** (e.g., database **126** of FIG. **1**) based on configuration rules or criteria provided to web analyzer **418**, for example, via a configuration loader module or PO client **420**. For example, web analyzer **418** may include an interface, such as a call server application programming interface (CAPI), to trigger an interaction center **428** (e.g., interaction center **124** of FIG. **1**) to populate interactions database **422** with relevant interactions that satisfy the configuration rules. In one example, a configuration rule may specify interactions where the user browses a page for a description of product X. Configuration rules may be the same or different for each user session, each customer service interaction, and/or each agent device **430**. In some embodiments, web analyzer **418** may save all webpages in a web session or may save only the subset of webpages that satisfy the rules defined by rule manager **426**.

A customer resolver **432** and/or **434** may be provided to identify which interactions belong to which customers or users, for example, by matching customer identifiers or extracted data to data in a customer database. Each matched interaction may be assigned a customer identification (ID) defining the associated customer in a mapping table, which may store the interaction ID, customer ID, associated keywords, associated identifiers, etc. Accordingly, when the interaction center connects an agent to a customer, the agent may easily access interactions linked to the customer via the customer ID. The agent may refine a search to access only a subset of the customer's relevant interactions, for example, by specifying interaction criteria or rules, such as, interaction topics, key-words, communication channel, time, etc. For example, a rule may be to access "all sessions in the past week for a specific customer" or "all sessions that include a product X." Customer resolver **432** may be connected to or disposed in interaction center **428** and alternatively or additionally, customer resolver **434** may be connected to or disposed in connection server **424**.

A business analyzer (BA) **436** (e.g., analysis server **116** of FIG. **1**) may automatically generate marketing, business or technology impact reports, or collect data for such impact analysis, for example, based on completed or past user sessions.

Interaction center **428** may include a customer resolver module interfacing with agent device **430** to provide agents with relevant user interactions from interactions database **422**. Agent device **430** may query BA **436** via connection server **424** for closed sessions and web analyzer **418** for open sessions. BA **436** and web analyzer **418** may supply agent device **430** with a list of closed and open sessions, respectively, for a specified user upon request. In some embodiments, interactions database **422** may store additional non-web interactions, such as telephone, email or messaging interactions, which may be provided to the agent device for additional cross-channel analysis to improve customer service. Agent device **430** may be provided with interaction details, including, for example, a history of the user's past web interactions, a summary of those interactions, a playback module to view simulations of those interactions and a guide listing recommendations to optimize those interactions. Interaction details may be provided to agent device **430** via an interface (e.g., via interface **200** of FIG. **2**).

Some embodiments of the invention may allow agent device **430** to track open session interactions on user computer **406** in real-time using PO client **420** (installed on agent device **430**). PO client **420** may transfer or make data available in real-time from open or current sessions (e.g., as well as past sessions). PO client **420** may transfer the data from each user computer **406** to one or more agent device **430**, for example, which are assigned to provide the user support. Agent device **430** may view a user's past session data as a history of relevant interactions, as a summary report of those interactions, or as a playback simulation of the interactions. In addition or alternatively, agent device **430** may view the user's current session data as a history or summary report updated in real-time or as a real-time interaction simulation in a shadow browsing interface. Agent device **430** may also be provided with a guide updated in real-time with recommendations targeted to the user's real-time interactions. By extracting user data via PO client **420** installed in a user computer **406**, the user profile may be automatically known and transmitted to agent device **430**, for example, without the user defining their identity, which may enhance both security and privacy issues in system **400**.

In one example, a user browses a website for a product or service X (e.g., X=a financial loan) and then calls (e.g. places a telephone call to) a provider of product or service X (e.g., a bank) at a later time. The user may be connected to an agent and the agent's device **430** may automatically (or after sending a request) access a summary of the web interaction, a link to shadow browse the user to view the user's current or real-time interactions and/or guidance tools to make recommendations, for example, for the agent to sell the user a product or service that is the same, similar or related to X.

Switch **404**, NIC **408**, probe **410**, IPS **412**, web analyzer **418**, PO client **420**, interactions database **422**, connection server **424**, rule manager **426**, interaction center **428**, agent device **430**, customer resolvers **432**,**434** and business analyzer (BA) **436** may each be, for example, software executed on one or more processors, and while this software may be in one processing device or server, it is not necessarily executed by the same processor or within the same computing device.

Web Analyzer

A web analyzer (e.g., web analyzer **418** of FIG. **4**) may analyze new web events from a capture database (e.g., capture database **416** of FIG. **4**) and may insert the analyze interactions (sessions) into an interaction database (e.g., interactions database **422** of FIG. **4**). The web analyzer may execute, for example, one or more of the following tasks:

Collect new pages from the capture database.

Session management.

Identify when new session starts.

Handle session termination.

Data extraction.

Perform webpage data extraction according to a PO client configuration.

Customer identification (e.g., from web cookie and/or from data extraction).

Supply list of open sessions for specific identifier upon request.

Interactions population via a database server using the CAPI.

Reference is made to FIG. **5**, which schematically illustrates a system **500** including a web analyzer **518** in accordance with an embodiment of the invention.

System **500** may include a web analyzer **518** (e.g., web analyzer **418** of FIG. **4**), a capture storage **514** (e.g., capture storage **414** of FIG. **4**), a capture database **516** (e.g., capture database **416** of FIG. **4**), a PO client **520** (e.g., PO client **420** of FIG. **4**), a connection server **524** (e.g., connection server **424** of FIG. **4**), an interactions database **522** (e.g., interactions database **422** of FIG. **4**) and an interaction center **528** (e.g., interaction center **428** of FIG. **4**). Web analyzer **518** may include a data provider **534**, a session manager **536**, an open sessions database **538**, a data extractor **540**, a post extractor **542**, a configuration loader **544** and a perform adapter **546** including a CAPI **548**. Other or additional components or devices may be used. Web analyzer **518** may be implemented as a system administrator plug-in in interaction center **528**.

Data provider **534** may retrieve web interaction events, for example, including page data (e.g., main pages, forms, etc.) from capture database **516** and post data (e.g., webpage metadata, content entered into fields, such as, a user name in a text box, etc.) from capture storage **514**, and may provide the events to session manager **536**. Session manager **536** may retrieve a list of open sessions from open (current) session database **538** and may define one or more closed (past) sessions for each user. Once the sessions are defined, data extractor **540** and/or post extractor **542** may selectively identify, filter, save or extract web interactions according to rules via configuration loader **544**. Data extractor **540** may analyze the page data and post extractor **542** may analyze the post data. Data extractor **540** and post extractor **542** may divide the extracted content into sessions, for example, as defined by session manager **536**. Session manager **536** may provide the session details to perform adapter **546**, which may transmit the details to interaction center **528**, for example, via CAPI **548**, to organize the interactions database **422** into sessions or retrieve data based on the sessions.

Data extractor **540** and/or post extractor **542** may extract a list of elements from each web page, for example, as described in reference to FIGS. **10** and **11**.

Components and processes of FIG. **5** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **7** may each be, for example, software executed on one or more processors.

Web Analyzer Interfaces

Web analyzer **518** may include a database interface to access capture database **516** and/or database tables and a file storage interface to access capture storage **514** and/or file systems. Web analyzer **518** may poll capture database **516** for new events and then analyze the corresponding files from the file system in capture storage **514**.

The database interface may be deployed on the same server as interactions database **522** (or on a different server). The interface may use an authentication platform, or such as, SQL Server authentication or Windows NT authentication, to validate the authenticity of transferred data. During system **500** installation, a new script may create a stored procedure, view and table that may be used by web analyzer **518**. The view may aggregate relevant data from various authentication tables. The stored procedure may return new events data based on the view. The table may keep track of what web analyzer **518** has fetched from capture database **516**.

The file storage interface may access shared folder on an IPS device. The file storage interface may store HTML pages (e.g., main pages events), for example, as .htm files. The file storage interface may store posts (e.g., form events), for example, as extensible markup language (XML) files. In addition, the file storage interface may store other web resources (e.g., images, java scripts, etc.), for example, as is, to be accessed directly by a document object model (DOM). Other or additional programming languages may be used.

Web analyzer **518** may include an interface with connection server **524** to supply users' current open sessions to connection server **524**, for example, as described in reference to FIGS. **6-9**.

Reference is made to FIG. **6**, which schematically illustrates an interface between a web analyzer **618** and a connection server **624** in accordance with an embodiment of the invention. The interface between web analyzer **618** (e.g., web analyzer **418** of FIG. **4**) and connection server **624** (e.g., connection server **424** of FIG. **4**) may supply connection server **624** with all the current open sessions according to customer identifiers, for example, one identifier for cookie identification and one identifier for web identification. Connection server **624** may, in turn, store the current open sessions at an interaction database, where the sessions may be accessible to an agent device **604** (e.g., agent device **430** of FIG. **4**) providing customer support.

In one embodiment, user computer **602** (e.g., user computer **406** of FIG. **4**) may connect to agent device **604**, for example, using an Internet protocol (IP) connection **606**. Agent device **604** may load user or customer data, such as, CRM details, into a PO client **620** (e.g., PO client **420** of FIG. **4**) and/or interaction database **622** (e.g., interaction database **422** of FIG. **4**), for example, each time a user contacts the agent. PO client **620** may extract transaction data **608**, (I,T), from IP connection **606** data, such as, cookies and/or web information. PO client **620** may send transaction data **608** to connection server **624**. Connection server **624** may send web analyzer **618** a request for supported customer identifier types. Web analyzer **618** may issue an identifier type **612**, (T), such as a web and/or a cockle identifier types. Connection server **624** may send transaction data **608** and/or identifier type **612** to database **622**, for example, using a customer resolver library **614**. Database **622** may return a user identifier (I) **626** and/or customer ID **616** associated with user computer **602**.

Once user identifier **626** is obtained, connection server **624** may send web analyzer **618** a request for open session data **628** associated with user identifier **626**. Web analyzer **618** may return current open session data **628** to connection server **624** associated with user identifier **626** and/or identifier type **612**.

Examples of requests for open session data **628** sent from connection server **624** to web analyzer **618** may include one or more of the following:

1. Get Current Supported Customer Identifier Types—web analyzer **618** may return current configured customer identifiers in the configuration of web analyzer **618**. Such a request may be, for example:
   void GetCurrentSupportedCustomerIdentifierTypes (out CustomerIdentifierType cookieCustomerIdentifierType, out CustomerIdentifierType pageCustomerIdentifierType.
2. Get Open Sessions Metadata For Customer Identifiers—web analyzer **618** may return current open sessions metadata (e.g., session ID and/or start time and date) according to customer identifiers (e.g., including a list of web identifiers and a list of cookie identifiers) and a website or web server ID. Such a request may be, for example:
   List<OpenWebInteractionMetaData>
   GetOpenSessionsMetaDataForCustomerIdentifiers (List<string>
   cookieCustomerIdentifiers,
   List<string>pageCustomerIdentifiers, int siteID).
3. Get Open Sessions With Session ID—web analyzer interface **610** may return the current open sessions (e.g., complete data) according a to given session ID. Such a request may be, for example:
   List<OpenWebInteractionData>GetOpenSessions WithSessionID (List<string>sessionIDs).

Data Structures in the requests may include, for example:

CustomerIdentityType Enumeration, which may be defined, for example, as follows:

Unknown=0,
IDCardNumber=1,
PhoneNumber=2,
EmailAddress=4,
ChatAccount=8,
WebLogin=16,

OpenWebInteractionMetaData object. Metadata from the web interaction may be used to describe one session identify data with properties defined, for example, as follows:

String—Session ID
DateTime—Start Date

PrimitiveData object, which may be defined, for example, as follows:

String—Key
String—Value

CompositeData object, which may be defined, for example, as follows:

PrimitiveData[ ]—PrimitiveDataArray
CompositeData[ ]—ChildCompositeDataArray
String—Key
String—Name

PageData object, which may be defined, for example, as follows:

PrimitiveData[ ]—PrimitiveDataArray
CompositeData[ ]—ChildCompositeDataArray
DateTime—StartDate
DateTime—EndDate
string—Title
string—Key
string—Name

OpenWebInteractionData object, which may be defined, for example, as follows:

OpenWebInteractionMetaData—WebInteractionMetaData
PageData[ ]—Pages

Other or additional data structures may be used in the requests.

Reference is made to FIG. **7**, which schematically illustrates a system **700** including a web analyzer **718** and a connection server **724** interacting via a connection service interface **722** in accordance with an embodiment of the invention.

Web analyzer **718** (e.g., analysis server **116** of FIG. **1**) may include connection service interface **722** to provide an interface for agents to query an interaction database (e.g., interaction database **124** of FIG. **1**) for open sessions. Connection service interface **722** may use a communication foundation based service, such as, Windows™ communication foundation (WCF), which may be implemented as a singleton service and may be a transmission control protocol (TCP) service. Connection service interface **722** may retrieve all open sessions (or a subset of open sessions) from a session manager **736**, for example, as a SessionsManager object, provided by a sessions structure manager **738**. Sessions may be converted, for example, to OpenWebInteractionData objects, and then returned to the client.

Components and processes of FIG. **7** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110** and analysis server **116**. Components of FIG. **7** may each be, for example, software executed on one or more processors.

Reference is made to FIG. **8**, which schematically illustrates a workflow **800** for retrieving open sessions in accordance with an embodiment of the invention. Workflow **800** may be executed by a connection server **824** (e.g., connection server **724** of FIG. **7**), a connection service interface **822** (e.g., connection service interface **722** of FIG. **7**), and a sessions structure manager **838** (e.g., sessions structure manager **738** of FIG. **7**).

In operation **802**, connection server **824** may send a request to connection service interface **822** for customer identifier types currently supported by a web analyzer (e.g., web analyzer **718** of FIG. **7**).

In operation **804**, connection service interface **822** may send supported customer identifier types retrieved from the web analyzer and may transmit them to connection server **824**.

In operation **806**, connection server **824** may send a request to connection service interface **822** for current open sessions metadata according to customer identifiers and/or a website ID.

In operation **808**, connection service interface **822** may transfer the customer identifiers and/or a website ID to sessions structure manager **838**.

In operation **810**, sessions structure manager **838** may return current open sessions metadata to connection service interface **822**.

In operation **812**, connection service interface **822** may transfer the current open sessions metadata to connection server **824**.

In operation **814**, connection server **824** may send a request to connection service interface **822** for current open sessions according a given session ID.

In operation **816**, connection service interface **822** may transfer the session ID to sessions structure manager **838**.

In operation **818**, sessions structure manager **838** may return current open sessions web interaction data to connection service interface **822**.

In operation **820**, connection service interface **822** may transfer the current open sessions web interaction data to connection server **824**.

Other operations or orders of operations may be used. Components and processes of FIG. **8** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **8** may be, for example, software executed on one or more processors.

Reference is made to FIG. **9**, which schematically illustrates a sessions structure manager **938** in accordance with an embodiment of the invention. Sessions structure manager **938** of FIG. **9** may be the same or different than sessions structure manager **738** of FIG. **7** and/or sessions structure manager **838** of FIG. **8**.

Sessions structure manager **938** may manage open sessions **902** in a web analyzer, for example, according to one or more of the following indexes:

- Site ID **904**.
- Open session data type, e.g., page **906** or cookie **908**.
- User Identifier **910**, e.g., the extracted identity from the web page or the cookie.

Other or additional indices may be used.

Referring again to FIG. **5**, web analyzer **518** may include another interface, for example, CAPI **548**, for populating the sessions as interactions in interaction database **522**. Web analyzer **518** may use a unique library to generate an interaction ID (e.g., a number representing an interaction record in database **522**). CAPI **548** may populate interaction database **522** with a contact ID (e.g., a number representing a contact record database **522**, which may be identical to, or derived from, the interaction ID), while web analyzer **518** may populate interaction database **522** with interaction content (e.g., interaction page, interaction data, page data, server event IDs (e.g., interaction, contact and/or customer IDs), etc., which may be unique only inside an interaction). In one embodiment, web analyzer **518** may use an "Insert" mode of CAPI **548** and not an "Open, Close" mode, such that, only closed sessions may be documented to interaction database **522**. Web analyzer **518** may provide a user or customer ID (e.g., a number representing a user or customer record in database **522**), for example, via a configuration file. Web analyzer **518** may create two participants, one for the user (if an identifier was extracted) and one for a virtual agent (e.g., an agent that represents web analyzer **518** that analyzes data that the user creates when they view a website or webpage). A hostname for CAPI **548** may be a local hostname, which may, for example, be hardcoded. A port for CAPI **548** may include a port taken from a plug-in during the web analyzer **518** start-up.

Other or additional system interfaces may be used.

System Operation and Configuration

Embodiments of the invention may provide a system and method for web recording and fetching new data. In order to fetch new data, a web analyzer may sample an authentication database and may search for new interactions or events that have not yet been processed. For each event fetched by the web analyzer, the analyzer may, for example:

- Identify whether the event belongs to a new session or not (e.g., the session ID may be extracted from the associated cookie).
- If the event belongs to a new session:
  - create a new session object and add each subsequent webpage to the new session object; and
  - attempt to extract the customer identifier from the cookie associated with the webpage.
- Locate the configuration for each webpage, for example, using one or more of the following event objects (other or additional event objects may also be used):
  - a URL for the webpage;
  - a title of the webpage; and/or
  - screen elements identified in the webpage (estimated from 10% of all pages).
- If the webpage configuration is not found, the analyzer may not save the webpage to the new session object.

The process may continue for each fetched event, for example, until the new session is closed (e.g., after a period of inactivity) or after a maximum session size or number of webpages are stored in the new session object.

Embodiments of the invention may provide a system and method for extracting data from new web recordings. In order to extract data, a web analyzer may, for example:

- Load the recorded webpage html to a DOM.
- Search webpage for screen elements according to a predetermined criteria stored in a table, for example, "tblWAScreenElementProperty," which may store web configuration details defining screen elements for web analyzer **518** to extract from the webpage. The screen elements may be defined and searched for, for example, using one or more of the following types of criteria (other or additional criteria may also be used):
  - ID, such as, an element ID;
  - Name, such as, an element name; and/or
  - Xpath, such as, "DIV[1]\DIV[2]\TABLE[1]\ . . . "
- Each element found in the recorded webpage may have its data extracted, for example, based on screen element value or column (e.g., nvcValueProperty) in the property table (tblWAScreenElementProperty).
- If more than one element is found for a screen element definition (e.g., repetitive or non-unique elements), data may be extracted from only the first detected one of such elements. Alternatively, data may be extracted from each of the multiple elements.
- If a customer identifier is not extracted from the webpage cookie, but a "Customer ID" screen element type is detected in the webpage, the data for such a screen element may be extracted and the session customer identification may be updated based thereon.

Embodiments of the invention may provide a system and method for session termination and data population for extracted web interactions. A web analyzer may, for example, after a predetermined number of minutes of inactivity, close a current session and pass the associated session object to a perform adapter (e.g., perform adapter **546** of FIG. **5**). If the session is "web authenticated" or a flag is raised, e.g., "Insert Web Unauthenticated Sessions," the web analyzer may insert a new interaction into an interaction database (e.g., interaction database **522** of FIG. **5**), for example, using an interface (e.g., CAPI **548** of FIG. **5**). In some embodiments, each session may include a single interaction and a single contact ID, while in other embodiments, each session may include multiple interactions and/or multiple contact IDs. Each webpage URL written to the interaction database may be a URL assigned by an authentication database and may be, for example, concatenated with a file ID (e.g., to enable playback). The perform adapter may pass the bulk of the sessions to the CAPI.

Embodiments of the invention may provide a system and method for the configuration of a system monitoring web interactions. The configuration may be loaded during the start up of the web analyzer. The parameters may be set as recording rules in the rule manager, while some parameters may be configured after installation manually, for example:

- User IDs
  - Defined in the user admin as mail users.
  - Inserted into the database by the interaction center, as is.
  - Testing User ID.
  - Operational User ID.
- Capture database hostname
- File access server (FAS) proxy location (URL). The FAS may be a server used for web session playback. A web player may connect to the FAS to play the user sessions from recorded session files in storage. For optimal performance, the FAS may be installed in the same device as the web analyzer, although the FAS may also be installed in other devices.

Embodiments of the invention may include one or more configuration parameters for monitoring web interactions (parameters may be loaded during the start-up of a web analyzer and may be configured manually after the installation. Examples of default parameters are defined in brackets "[ ]". Configuration parameters may include, for example:

- Insert "Web Unauthenticated" sessions [False]—inserts session sessions (e.g., into an open sessions database **538** of FIG. **5**) for which no user or customer identifier has been extracted for the database.
- Insert "User Unauthenticated" sessions [False]—inserts session sessions for which the extracted user data or ID is not found in a customer or user database.
- Testing mode flag—indicates whether or not to pass the testing user ID or the operational User ID to the CAPI.
- Remove an HTML tag element (e.g., Href) and scripts flag [False]—indicates whether or not to remove all metadata, such as, hyperlinks and java scripts, before data extraction.
- Session termination timeout interval [20 minutes]—defines a number of minutes to wait before terminating a session (e.g., from the last fetched event).
- insertToPerfomTimeoutInSeconds [10]—Perform Adapter sends interactions to CAPI in bulks (or groups of interactions). If a bulk is not filled by the time specified in this parameter, the bulk may be (or may not be) sent anyway.
- eventsPollingTimeout [2 minutes]—the time interval between each polling to the capture database.
- maxUnhandledEvents [1000]—the queue size of the session manager.
- customerIDType [Email]—the identification format for each customer or user.
- Sysadmin host name and port—inserted automatically by a deployment manager during installation.

Other or additional configuration parameters may be used.

Embodiments of the invention may provide a deployment manager for deploying a web analyzer (e.g., web analyzer **518** of FIG. **5**) and a customer entity database, for example, using an interaction center (e.g., interaction center **528** of FIG. **5**). The interaction center may handle additional media types other than web media, such as, text or messaging media, telephone call recordings, surveys, etc. The interaction center may handle a new deployment package, which is dependent on the interaction center package, but which may be installed separately therefrom. In embodiments where the web analyzer has no plug-in, some configuration parameters may be entered manually after installation.

Embodiments of the invention may provide a system and method for testing the configuration and deployment of systems monitoring web interactions. For example, system **500** of FIG. **5** may be adapted to include emulators or testing modules configured with temporary or testing parameters and setting. For example, emulators or testing modules may be implemented for data provider **534**, CAPI **548** and/or configuration loader **538** to test the operation of system **500**. Emulators may be adaptive, for example, modifying parameters or function to optimize testing operation. Parameters correlated with optimal system **500** testing operation may be set after testing for actual system operations.

Testing may be executed separately for different types of websites, e.g., one resembling a banking website and one resembling a different commercial website. Testing may include all (or a subset) of the system devices and functionality (e.g., tested end-to-end), for example, including those involving interaction business applications (IBAs) and real-time interaction or guidance capabilities. Testing may be executed to verify performance criteria according to a usage model defining an average or maximum volume of customer web interactions over time (e.g., up to 1 million (M) or 5M page views per day).

The testing flow may be executed as follows (other or additional steps may also be used):

- Record a session (session may include all or a subset of session web pages).
- Send PO client configuration XML file to tester.
- Run or execute tester on recorded session.
- Tester may display web pages and data extraction.

In some embodiments, configuration parameters and/or rules may be imported into the system from a PO client (e.g., PO client **520** of FIG. **5**). The rules may be imported to a rule manager (e.g., rule manager **426** of FIG. **4**), for example, as part of the rule manager scheduler rules. The PO client configuration XML may be loaded to an administrator database. The system may support only one site per configuration. Configuration parameters may be loaded using a "Configuration Loader" library (e.g., available for a business analyzer). Deleted Types, Objects, and Screen Elements may be marked as deleted.

Embodiments of the invention may include a customer resolver to identify a customer or user that executes each interaction, for example, so that an agent may access all (or a subset of) customer-specific interactions. The customer resolver may include a dynamic link library (DLL), for example, located in and/or accessed by the interaction center (e.g., customer resolver **432** of FIG. **4**) and/or in a connection server (e.g., customer resolver **434** of FIG. **4**). When the customer resolver is located in the interaction center, a web analyzer may report web interactions to the interaction center, e.g., via a CAPI, using a customer identifier, identifier type and/or tenant ID. The interaction center may use the customer resolver to resolve the identifier to a customer ID. The interaction center may insert the customer ID into a mapping table (in the interaction center) that holds entries that map interactions in the interactions database to customer records or IDs in the customer database. When the customer resolver is located in the connection server, the connection server may query the web analyzer to receive the identifier types that the web analyzer supports. The connection server may use the customer resolver to translate the identifiers it extracts to identifiers with types that the web analyzer supports. The connection server may query the web analyzer for open sessions according to identifiers received from the customer resolver.

The customer resolver may include an API. The customer resolver API may return a customer ID according a given

tenent ID, customer identifier and/or identifier type. The customer resolver API may return customer identifiers for a given customer type of a given customer ID. The customer resolver API may get customer identifiers having the types supported by the web analyzer, for example, based on the tenant ID and the identifier and identifier type extracted by the connection server. A tenant may include service suppliers or intermediaries that supply system capabilities to users.

Data Extraction

Reference is made to FIG. **10**, which schematically illustrates a path **1000** to locate elements to be extracted from a document in accordance with an embodiment of the invention. Data elements may be extracted at path **1000** location by a data extractor (e.g., data extractor **540** and/or post extractor **542** of FIG. **5**) or other devices (e.g., web capture servers **110** of FIG. **1**).

The data extractor may use path **1000** to search a web site **1002** for a web page **1004** containing a list of products **1006**. The data extractor may retrieve screen elements defined by path **1000** locations. If path **1000** indicates a search for a list of products **1006**, the data extractor may extract a list of product screen elements **1008**; if the search criteria indicate product names **1010**, the data extractor may extract name screen elements **1014**; if the search criteria indicate prices **1012**, the data extractor may extract price screen elements **1016**.

In one example, path **1000** may be an XML path or an Xpath, which may locate screen elements in an HTML or XML document. For example, an Xpath defining a list of products **1006** may be, for example, DIV[2]/DIV[1]/DIV[1]/DIV[4]/FORM[2]/DIV[1]. Every product in the list may be found under the list Xpath in the next DIV, TR tag or other an HTML tag element. For example, the first element may be found under DIV[1], the second element may be found under DIV[2], and so on. In some embodiments, a more complex operation may be used to find the elements. For example, if there are two path variables, x and y, the x index may refer to a start location for extracting elements (e.g., the first element, the second element, etc.) and the y index may refer to a "jump" or difference between consecutive start element location (e.g., extract every second element, every third element, etc.). For example, if x=4 and y=2, the first element may be found under DIV[4], the second element may be found under DIV[6], and so on.

Under every product Xpath, the product details (e.g., name **1010** and price **1012**) may be found. For example, the product name **1010** may be found under the Xpath, DIV[3]/DIV[1]/DIV[1]/DIV[1]/H3[1]/A[1], and the product price **1012** may be found under the Xpath, DIV[2]/DIV[1]/H4[1].

The element XML may be divided into different parts, for example, container (the list), language, and product element. In one example to extract a product price **1012** element from a webpage, the Xpath may be: DIV[2]/DIV[1]/DIV[1]/DIV[4]/FORM[2]/DIV[1]/DIV[4,2]/DIV[2]/DIV[1]/H4[1],
where the first Xpath part, DIV[2]/DIV[1]/DIV[1]/DIV[4]/FORM[2]/DIV[1], may define the list container, the second Xpath part, DIV[4,2], may define the language and the third Xpath part, DIV[2]/DIV[1]/H4[1], may define the product price. In another example to extract a product name element from a webpage, the Xpath may be: DIV[2]/DIV[1]/DIV[1]/DIV[4]/FORM[2]/DIV[1]/DIV[4,2]/DIV[3]/DIV[1]/DIV[1]/DIV[1]/H3[1]/A[1], where the first Xpath part, DIV[2]/DIV [1]/DIV[1]/DIV[4]/FORM[2]/DIV[1], may define the list container, the second Xpath part, DIV[4,2], may define the language and the third Xpath part, DIV[3]/DIV[1]/DIV[1]/DIV[1]/H3[1]/A[1], may define the product name. The language field of the Xpath may define which elements to extract from the container. The tag name may define relevant tags in the list of elements in the container, the first number may define from which element to start and the second number may define the increment between the elements. For example, for the language defined by the Xpath, DIV[4,2], data extractor **540** may extract every second element starting from the fourth element. It may be appreciated that different webpage document locators may be used other than Xpath and other programming languages may be used other than XML and HTML.

Reference is made to FIG. **11**, which schematically illustrates an example of a webpage **1100** with extracted screen elements **1102** and **1104** defined by paths **1014** and **1016**, respectively, of FIG. **10** in accordance with an embodiment of the invention. In the example shown in FIG. **11**, a product price screen element **1102** and a product name screen element **1104** are extracted from webpage **1100**, although alternatively or additionally other types of screen elements may be extracted at other path locations. Webpage **1100** may be provided, for example, by a web server **122** of FIG. **1**.

To extract screen elements, a web analyzer (e.g., web analyzer **518** of FIG. **5**) may locate all screen elements in webpage **1100** and attempt to extract them from the page. Screen element marked as list may be extracted in three parts, for example:

1. The list (container) may be extracted (e.g., using the list screen element Xpath).
2. All the list products will be extracted (e.g., using the object screen element value property).
3. Recursively review all the list products (e.g., extracted in step 2) and compare them to all the "children" path elements of the list products (e.g., using the screen elements defined in the next term(s) of the Xpath).

In some embodiments, path **1000** of FIG. **10** may also define screen elements that are not to be extracted from webpage **1100** of FIG. **11**, for example, for privacy purposes.

System Usage for Web Recording

After face-to-face interactions and telephone calls, the web is the most utilized channel for customers to interact with service organizations. Although the interactions between the customer and the organizational web servers are different in nature than human-human interactions, extremely valuable information may still be extracted from them to later assist the contact center in handling customers.

Web recording systems (e.g., systems **100** and **400** of FIGS. **1** and **4**) may allow a capture device (e.g., capture server **110** of FIG. **1** and probe **410** of FIG. **4**) to capture web traffic, a web analyzer (e.g., analysis server **116** of FIG. **1** and web analyzer **418** of FIG. **4**) to filter or extract requested information from the captured traffic and a database (e.g., interaction database **126** of FIGS. **1** and **422** of FIG. **4**) to save relevant extracted information, for example, for later analysis and playback.

Web recording systems may be used to understand cross-channel customer behavior. Many customers use different interaction channels and switch from one channel to another. To optimize channel usage, customer activity may be recorded across different communication channels.

Web recording systems may be used to provide contact center with customers' past web interactions, for example, according to the following steps:

A customer may interact with a web server (e.g., web server **122** of FIGS. **1** and **402** of FIG. **4**).

Afterwards, the customer may utilize another channel (e.g. voice, chat, messaging) to interact with an agent.

The agent may receive a real-time guidance message generated by a PO Client (e.g., PO Client **420** of FIG. **4**). The guidance message may notify the agent that the customer interacted with the web server in the past.

The real-time guidance message may offer the agent recommendations, for example, up-sell or cross-sell options, according to business rules and the analysis of the customer's past web server interaction.

The real-time guidance message may offer to "play" or simulate the customer's past web interaction for the agent.

Web recording systems may be used to provide a contact center with customers' current or ongoing web interactions, for example, according to the operations such as the following (other operations may be used):

A customer may interact with an agent.

The customer may start interacting with the web server, either without the agent's knowledge or according to the agent's instructions.

The agent may receive a real-time guidance message generated by the PO Client, for example, notifying them that the customer is interacting with the web server.

The real-time guidance message may offer to "shadow browse" the customer, showing the agent each relevant browsing decision the customer makes.

Web recording systems may be used to evaluate an agent's performance, for example, according to the following steps:

A customer may interact with an organization's web site before or after their interaction with an agent.

A supervisor for the agent may play back and evaluate the agent/customer interaction

The supervisor may also play back the customer's related web interactions (as part of a sequence or as a complete interaction), for example, in order to fully understand the context or the outcome of the agent-customer interaction before finalizing the evaluation.

Web recording systems may be used to understand a specific customer's cumulative cross-channel interactions, for example, according to the following steps:

A supervisor may investigate a specific customer case by querying the customer's interaction history and playing back the customer's past web interactions.

Web recording systems may accommodate different web interaction capture solutions (separately or together, e.g., in parallel). Some web recording systems may use a probe connected to an IPS (e.g., probe **410**/IPS **412** of FIG. **4**) to capture web interactions by sniffing traffic from a web server (e.g., web server **402** of FIG. **4**) and may filter the traffic. In one example, the system may sniff hypertext transfer protocol (HTTP) traffic of web servers and filter the traffic by URL via a web capture server.

Reference is made to FIG. **12**, which schematically illustrates a system **1200** for capturing a user's web interactions in accordance with an embodiment of the invention. System **1200** includes a plurality of web servers **1202** (e.g., web servers **122** of FIG. **1**), a plurality of web capture servers **1204** (e.g., capture server **110** of FIG. **1** including probe/IPS devices), and a plurality of interaction centers **1206** (e.g., interaction centers **124** of FIG. **1**). Each web server **1202** may be monitored by one or more web capture servers **1204** and each web capture server may be processed or filtered at one or more interactions center **1206**. In one embodiment, each web capture servers **1204** may monitor a user's web interactions, which may include monitoring traffic from multiple web servers **1202** when the customer is interacting with several web servers simultaneously. System **1200** may recognize such a multi-web server scenario and may automatically associate all the related captured web sessions to the same customer.

One or more web analyzers may be provided, for example, as a system administrator plug-in in interactions center **1206**. The web analyzers may be able to construct web sessions or group the filtered traffic into sessions, for example, according to standard session parameters derived from metadata such as cookies. The web analyzers may truncate web sessions to include only relevant web pages, which may be referred to as web interactions, and may extract values from these web pages. Each interactions center **1206** may be connected to a PO client, which may be define relevancy criteria, logic and other configuration parameters for the web analyzer to extract, filter, store and otherwise use the users' web interactions data.

System **1200** may authenticate customer sessions for web sessions by extracting (but not necessarily resolving) a unique account or customer identifier. System **1200** may support multiple mechanisms for authenticating customer sessions, for example, by associating a cookie value to a system-defined unique identifier and/or by associating a value extracted from the web pages to a system-defined unique identifier.

Components of FIG. **12** may each be, for example, software executed on one or more processors.

Reference is made to FIG. **13**, which schematically illustrates components of the system of FIG. **12** in accordance with an embodiment of the invention.

A web server **1302** (e.g., web server **1202** of FIG. **12**) may provide information, such as, HTML, Capture Asynchronous JavaScript and XML (Ajax), rich internet applications (RIA), web player information, images or other formats of information, which may be hosted on a user computer (e.g., user computer **102** of FIG. **1**) via a web browser.

A web capture server **1304** (e.g., web capture server **1204** of FIG. **12**) may include a probe server sniffing device or process to capture web traffic, a protocol parsing device to sort the captured traffic based on web protocol (e.g., HTTP traffic, FTP traffic, IM traffic, etc.), a client collector to determine a user or customer ID, and a client capture to collect web events for each customer.

An interactions center **1306** (e.g., interactions center **1206** of FIG. **12**) may convert captured web events into web interactions by filtering out relevant web pages that satisfy relevancy criteria and extracting the associated interaction data. Interactions center **1306** may include (or be connected to) a designer or PO client to define data extraction rules, scheduler rules, and/or session rules, a reconstruct module to reconstruct or group interactions into sessions, and a content extraction device to extract web content according to the extraction rules.

An interactions database **1308** (e.g., interactions database **124** of FIG. **1**) may store extracted web interactions. Interactions database **1308** may include an index server to index the web interactions for proper storage and retrieval, database metadata including extracted metadata associated with each web interaction, and storage data and images for the interactions.

An insight manager **1310** may categorize the web interactions using a categorization module. A web analyzer **1312** (e.g., analysis server **116** of FIG. **1**) may provide applications to an automated or live agent for ad-hoc searching (e.g., of voice and text data) and/or intervening in customer sessions. A web player **1314** (e.g., web player **1710** of FIG. **17**) may be used for playing back the web interactions. A reporter module **1316** may perform cross-channel analytics to analyze inter-

actions over multiple communication channels, such as, web, telephone, messaging, etc. Reporter module **1316** may be located in a cross-channel reports block or module (e.g., in agent device **120** or interaction center **124** of FIG. **1**). Reporter module **1316** may generate reports of the cross-channel analytics, for example, using a business analyzer (e.g., BA **436** of FIG. **4**).

In some embodiments, a system administrator, user or agent may be able to configure web recording rules, for example, as described in reference to FIGS. **14**A-**14**C.

Reference is made to FIGS. **14**A-**14**C, which schematically illustrate interfaces **1400**-**1404** for configuring a rule scheduler in accordance with an embodiment of the invention. The rule scheduler may define web recording rules, each of which may relate to a specific web analyzer or a group of web analyzers. Interfaces **1400**-**1404** may be provided, for example, to an agent (e.g., at agent device **120** of FIG. **1**), client (PO client **420** of FIG. **4**) or product developer (e.g., PO designer **1706** of FIG. **17**), to select scheduler rules and configuration parameters.

Web recording rules in the rule scheduler may include, for example, one or more of the following (other or additional scheduler rules may also be used):

- Web sites (domains) to be identified and recorded, for example, by the web analyzer.
- Web agents to be associated with the interactions (e.g., tenant specific). These may be identified, for example, by the interaction center.
- Web analyzer definition files created by the PO Client.
- Whether or not to create web interactions from web sessions that are not customer-authenticated.
- Whether or not the web interactions include only web pages defined by the PO client or all captured web pages.
- A customer-authentication method **1504** (e.g., cookie or web element) and an associated customer identifier **1506**, such as, a unique account ID, customer ID, telephone number, mobile phone number, general number, email, chat ID, web customer ID, account information, etc. Customer-authentication method **1504** and customer identifier **1506** may be set at interface **1502** of FIG. **15**.

An agent may be able to configure the web storage rules in a rules manager (e.g., rule manager **426** of FIG. **4**). Rules manager may add a new media type ("Web") using a Filter→General definitions in the storage rules filter definition dialog, which may render other media types, call direction definitions, evaluation filter definitions and desktop analytics filter definitions disabled. Storage rules may define which interactions to archive by the storage center. Rules manager may change archive web interactions according to account and customer information filters. In addition, the expressions tab in the storage rules filter definition dialog and the file name mask tab in the storage action dialog may be expanded to include a web sites (domain) attribute.

Web Interaction Playback

Reference is made to FIGS. **16**A-**16**B, which schematically illustrate playback interfaces **1602**-**1604** for viewing user web sessions in accordance with an embodiment of the invention. Playback interfaces **1602**-**1604** may be provided, for example, to an agent at an agent device (e.g., agent device **120** of FIG. **1**) to provide customer service to the user.

Playback interface **1602** may provide a simulation of the user's web interactions over one or more sessions, for example, including one or more web page screenshots **1606** browsed by the user, associated web interaction data (e.g., including topic, value of the extracted element, log time/initial browse time, duration/total browse time, and one or more additional variables or criteria), a summary **1610** of the session or web page interaction, and controls **1612**, for an agent to operate the session simulation (e.g., to scan or skip forward or backwards through the web pages viewed). Each web page **1606** may include a still image or screenshots of the web page and/or a video of the user interacting with the page, for example, moving a cursor over the page, entering information into data fields, etc. In some embodiments, relevant or target information in the page (e.g., extracted screen elements **1102**, **1104** of FIG. **11**) may be highlighted or otherwise marked. Web page **1606** may expand from a thumbnail in interface **1602** to a larger, e.g., full-size or mid-size, image or video of the web page in interface **1604**.

Web interactions may be provided to a virtual web agent that may represent the organization side of the interaction. In hosted environments, each tenant may have their own web agent for associating web interactions. Tenants (e.g., users providing system capabilities to other users) may only have visibility and access to their own web interactions.

An agent (e.g., at agent device **430** of FIG. **4**) may use playback interfaces **1602**-**1604** to query and play back past web interactions (e.g., from a business analyzer or interactions database). The playback information may be stored in an interaction database (e.g., database **422** of FIG. **4**) and/or a capture storage (e.g., storage **414** of FIG. **4** for storing html files). The agent (e.g., agent device **430** of FIG. **4**) may use a PO client (e.g., PO client **420** of FIG. **4**) to select the specific user session to view. Playback interfaces **1602**-**1604** may play back past and/or ongoing web interactions, for example, allowing a PO client to send a relevant notification to the agent, including web interaction information. Visibility to ongoing interactions may have a predetermined maximum delay of, for example, 10-30 seconds, from the time the user starts interacting with the website. An agent may be able to play back a past web interaction via a link provided in a real-time guidance message created by the PO client. An agent may able to play back an ongoing web interaction (e.g., by shadow browsing) via a link provided in a real-time guidance message created by the PO client, for example, with a predetermined maximum delay of 5-20 seconds. While playing back ongoing web interactions, the web player may be constantly updated with new user browsing data and may allow showing either all pages browsed by the user or only relevant pages defined in the PO client (e.g., configurable via the web player). An agent may be able to play back a web interaction while browsing the website in real-time to compare system behavior (e.g., by "co-browsing"). The agent may be able to play back multi-website scenarios in one playback window (e.g., by multi-session unified playback).

Other play back interfaces or functionality may be used.

System Specifications

Web interaction capture solutions may include, for example, the following (other or additional solutions may be used):

- Automatically alerting a user of web recording on web sites.
- Identifying channel containment for analyzing the reasons that users switch from one communication channel (e.g., the web) to another (e.g., telephone).
- Giving real-time guidance to agents based on current and past web interactions of the same customer.

Allowing agents to view a customer's session.

Some benefits of web recording solutions include, for example, the following (other or additional benefits may be found):

- Non-intrusive server side capture as opposed to the most of the vendors, which perform direct integration and require changes to be done in the web server implementation.
- Generic solution, e.g., not oriented to certain vertical or horizontal web sites.
- Provides customer resolving and cross channel correlation, which many vendors cannot offer, as they do not have access to the customer repository or to the customer's multi channel interactions.

Web recording systems may support up to N (e.g., N=5) multiple channel interactions performing web recording. Each multi-channel interactions center may be targeted to support multiple web capture servers and handle usage models (e.g., a model of the target amount or rate of traffic that may be monitored by the system, such as, 100,000 user sessions per day). Up to N multi-channel interactions centers may be supported in a linked web recording system configuration. In one example, web recording systems may support customers with up to 5 million page views per day and 200,000 web interactions per day using 85 GB of data per day (e.g., without images). The Multi-channel Interactions Center handling web recording may also be able to handle voice and text recording in conjunction with the web recording, for example, by re-appropriating and reducing web recording capacity or by increasing system capacity. A maximum of one (or more) storage center (e.g., interaction database **422** of FIG. **4**) may be used to store all web interactions in the web recording system.

For system security, the user may be able to define, for example, in the PO client, specific screen elements that are not to be extracted from web pages or available for playback. Such screen elements may adhere to privacy standards across industries, such as, financial privacy standards, e.g., payment card industry (PCI) standards, medical information privacy standards, technological privacy standards, etc.

Web recording systems may support one or more of the following resiliency mechanisms (other or additional resiliency mechanisms may also be used):

- Multi-channel interactions center cluster.
- Multi-channel interactions center geo-cluster.
- Storage center redundancy.
- Virtualization for multi-channel interactions center.
- NIC teaming for the multi-channel interactions center.

Web recording systems may support any usage scenarios when voice interactions are imported using a platform agnostics solution.

Web recording systems may use "certified server" specifications to support the multi-channel interactions center and/or web capture server. The "certified server" specifications may define hardware (HW)/software (SW) specifications including, for example, one or more of the following (other or additional HW/SW specifications may also be used):

- HP G6 server or equivalent.
- 2 Quad Core Nehalem 2.26 GHz processors.
- 4 GB DDR-3 RAM.
- 2x4p1GBps NIC.

The multi-channel interactions center may also be supported as a virtual machine.

Web recording capabilities may be integrated into or licensed to other systems, for example, using a licensing manager software or plug-in, such as, KeyGen. A "Web Recording" option may be added (e.g., under application server license→rule mngr→scheduler). A "Web Analytics" option may be added (e.g., under application server license→interaction analytics→multichannel). In some embodiments, a system administrator user interface related to web recording may be hidden if the web recording capability is not licensed.

For deployment, a site readiness tool may verify readiness for web capture server installation and the deployment manager may deploy both the multi-channel interactions centers and the web capture servers. For maintenance, both the multi-channel interactions centers and the web capture servers may be monitored by a monitoring tool or sentinel. A log collector may collect log entries of the web analyzer and web capture server.

In alternative or additional embodiments, web recording systems may include features, for example, as follows:

- Capture web interactions via client-side tagging.
- Provide HTTP secure (HTTPS) decrypt devices, which may be deployed on the customer websites, capture HTTPS packets, decrypt them using private keys and send the decrypted packets to web capture servers.
- Configure the IPS/Probe solution via a system administrator and not locally.
- Capture Ajax based controls and relate them to associated web interactions.
- Encrypt web interactions as part of the system-wide media encryption process.
- Redundancy solution in which multiple probes capture the same or overlapping web traffic yet only one web interaction is created to reduce redundancy.

Real-Time Guidance

An agent may provide a customer with real-time guidance based on the user's past or current web interactions. The real-time guidance may notify the agent that the user has interacted with a web server in the past or is currently interacting with the web server in the present. The real-time guidance message may offer recommendations for agent to communicate to the user, for example, including up-sell or cross-sell options. The real-time guidance message may also offer to play back past web interactions and/or shadow-browse current web interactions. Real-time recommendations and/or playback may be provided, for example, while the contact center agent is communicating with said user or during or concurrently with the customer interactions or at a small time delay thereafter (e.g., on the order or a few second or milliseconds). The agent may be fully automated (e.g., an automated pre-recorded voice response, web message, SMS message, pop-up window or email system) or semi-automated (e.g., an automated guide prompting a live agent to communicate).

Reference is made to FIG. **17**, which schematically illustrates a system **1700** for providing real-time guidance in accordance with an embodiment of the invention. Real-time guidance functionality may be provided, for example, via FIG. **1** using web capture server **110**, analysis server **116**, agent device **120**, and interactions center **124** and/or their processors **112**, **132**, **136** and **142**.

System **1700** includes an agent workstation **1702** (e.g., agent device **120** FIG. **1**), a PO client **1704** (e.g., PO client **620** of FIG. **6**) and a connection server **1704** (e.g., connection server **624** of FIG. **6**). Agent workstation **1702** may use connection server **1704** to connect to PO designer **1706** via a PO client **1708**. PO designer **1706** may be operated by an agent, administrator, or product developer (e.g., at agent device **120**, analysis server **116** and/or interaction center **124** of FIG. **1**).

PO client **1708** may transfer data in real-time from user computers to agent workstation **1702**. The data may be transferred securely, for example, using license enforcement. Agent workstation **1702** may include a web player **1710** to play images or video of the user's current session. Agent workstation **1702** may include a playback interface (e.g., playback interface **1602-1604** of FIGS. **16**A and **16**B) to operate web player **1710**.

PO designer **1706** may define, for example, one or more of the following parameters (other or additional parameters may also be defined):

- Website elements for analyzing:
  - Website
  - Web pages for data extraction.
- Web business entities.
- Web screen elements.
  - Customer identifier.
- Real-time guidance rules.

PO client **1708** may execute, for example, one or more of the following operations (other or additional operations may also be executed):

- Use web analyzer data extraction in real-time, for example, to issue real time guidance messages to agent workstation **1702**.
- Evaluate real-time guidance rules based on the web analyzer data extraction.
- Launch web player **1710**.

Connection server **1704** may return, for example, one or more of the following web session data to PO client **1708** upon request (other or additional session data may also be returned):

- Web sessions includes:
- Ongoing session of the customer.
- Past sessions of the customer.
- Web session data includes:
- Session dates, duration, categories
- Pages and their extracted values

Web player **1710** (e.g., launched at agent device **120** of FIG. **1**) may display, for example, the following (other or additional elements may also be displayed):

- Session pages.
- Session metadata.
- Page web display.
- Page Summary.

In some embodiments, a system administrator, product designer or company agent (e.g., agent device **120** or administrator at interaction center **124** of FIG. **1**) may configure web analytics solutions for a web analyzer (e.g., analysis server **116** of FIG. **1**), for example, as described in reference to FIGS. **29**A-**29**X. Web analytics solutions may include projects created by a PO designer to include a web configuration defining parameters for monitoring, capturing and extracting elements from the user's web sessions.

Components in system **1700** may have, for example, the following functionality.

- PO Client **1708** may consume web session data for real-time guidance rules.
- PO Client **1708** may utilize connection server **1704** service upon demand.
  - Web analytics licenses may be enforced.
  - Synchronous and asynchronous functionality may be available.
  - 'Data Loaded' event may be exposed to the user (e.g., with asynchronous functionality).
- PO Client **1708** may launch web player **1710** upon demand with an interaction ID.
- PO Designer **1706** may include, for example:
  - A new 'web analytics' package.
  - A new solution orientation target, including:
    - A validation of web analytics configuration project.
    - XML generation.
  - New function editors, including:
    - A map of HTML table elements to Business Entity lists.
    - Consume web sessions data.
- PO Client **1708** may include, for example:
  - New library objects to:
    - Extend connection server **1704** service functionality.
    - Launch web player **1710**.
- Setups may include, for example:
  - A web connector, such as, an Internet Explorer (IE) connector, to define the screen connectivity, for example, between the GUI controls of a desktop application. The screen connectivity layer in PO Client **1708** may include a set of connectors, for example, each responsible to communicate with a specific technology to uniquely identify a specific screen element within a given application screen. The web connector may be responsible for the communication with the Internet provider application. Web connector may be a code layer installed in one or more device in system **1700** for example, in PO Designer **1706** and/or PO Client **1708**. Web connector may be setup in a default setup.
  - Deployment of web player **1710** dynamic link library (DLL) as part of a connection server **1704** upgrade.

System Optimization

Embodiments of the invention may optimize real-time guidance workflow performance for web analytics. In one embodiment, real-time guidance may provide an agent with information on user's web interactions and advice to recommend to the user in real-time, for example, as the user interacts with the web. A customer resolver may may resolve a customer resolving by using a customer data base to translate a user or customer identifier (e.g., extracted by web analyzer **418** of FIG. **4**) into a customer ID. Customer resolving may be executed by a customer resolver (e.g., customer resolver **432** and/or **434** of FIG. **4**) using stored procedures, which may be invoked at an agent device or interaction center (e.g., agent device **120** or interaction center **124** of FIG. **1**) according to a real-time guidance workflow. The stored procedure may return a customer's web login from the identifier that is retrieved by a PO client. The stored procedure may run or execute on a customer database to support, for example, up to 50 million customers. As with other examples discussed herein, other capacities, numbers of customers, limits, etc. may be used. Customers' ongoing sessions may be retrieved, for example, upon demand or automatically after an agent connects e.g., via a telephone call, to the customer. In some embodiments, the ongoing sessions may be retrieved from a single web analyzer which stores the open sessions in a memory.

The web analyzer may support scale out and may store the open sessions, for example, in a distributed cache and/or interaction center. Scale out may duplicate instances at some servers, for example, to extend the load capabilities of the servers. The connection server may use a DLL provided by

web analyzer to access the open sessions repository to retrieve (e.g., and register for events of) specific customer's open sessions.

Customers' past sessions may be retrieved. Customers' past sessions may include connection server queries for the individual customer's web interactions. A business analyzer service may generate the past sessions data for single and/or multi-site queries. In one embodiment, customers' past sessions may be stored in a cache that may hold, for each customer, the web interactions in a predetermined past time interval (e.g., the past N months). The cache may store session data only for customers that have interacted on the web within a predetermined past time interval (e.g., the last M days). The connection server may access the cache in the real-time guidance workflow. The cache may be configured, for example, as a distributed cache, for example, using a distributed cache wrapper infrastructure, or as a local cache or database in each web analyzer.

The connection server may query a long term data storage to search for the customers' past interactions. Using the long term storage to search for the customers past interactions may free the load from business analyzer services. However, using the long term storage may cause complications, for example, due to a possible wide area network (WAN) between the connection server and long term storage and due to the long term storage missing the most recent past interactions (e.g., occurring in the last hour). In order to include the most recent (e.g., last hour) customer interactions, sessions in a distributed cache may not be immediately cleared once they close, but may only be cleared after a predetermined time delay (e.g., one hour).

Embodiments of the invention may support definitions and deployment for multiple file access servers (FASs). For file access server (FAS) scale out, the load balancer may support routing to the different connect server instances, for example, by "sticky" routing. The FAS component may be responsible for streaming extracted data, such as, html files constructed by an IPS. If multiple FAS components are used, for example, in order, to increase processing capabilities, a load balancing mechanism may be implemented between all the FAS instances to evenly distribute the processing load therebetween. "Sticky routing" may provide a system in which once a user connects to a FAS instances, the user may continue to connect with this FAS instance until the end of the user's session.

Embodiments of the invention may scale out connection server to support concurrent requests for customer's web sessions. Such embodiments may have implications on the system and recordings infrastructure, which may use a load balancer to route requests to the different connect server instances.

Some embodiments of the invention may correlate an interaction to an account ID rather than to a customer ID. The web recording rules may allow selection of whether to correlate the web interaction to an account or customer ID.

Privacy standards, such as, PCI standards, may identify protected customer information that should not be extracted from posts. To conform to such standards, the PO designer may use a screen element option to "hide" such sensitive content in the playback. These protected objects may be "negative screen elements," which may define screen elements to be removed from the web player.

Web recording rules in rule manager may be used to manage many system specifics, such as, inserting authenticated sessions, identifying the user (e.g., whether to identify the user using metadata/cookies or screen elements and/or the column in the customer entity database with which the extracted values are to be associated), etc. When defining a rule, the rule manager may also need to define the customer mapping for each website (or globally for all websites). A rule scheduler may read voice/screen recording rules and may send the recording decisions to a recording manager (RCM) (e.g., in the Interaction center) or alternatively, may not refer to the web rules. The rule may support a hosting environment, i.e., the rule may be attached to a specific tenant. In some embodiments, all services may work with new/modified configurations without restarts.

Embodiments of the invention may support multiple web analyzers operating concurrently or in parallel. A single manager may distribute and divide the work among the multiple web analyzers. Dividing the work may improve the overall scale of the system and also ease the effort of developing the open calls events distribution (e.g., if the distributed cache solution is used).

Embodiments of the invention may optimize the web analyzer-IPS interface. In some embodiments, the interface may include a database and file system interface. However, in order to improve the performance and allow events in open sessions to occur almost immediately, the interface may be replaced by a direct call from the IPS to the web analyzer, where the IPS sends HTML data or each main page event to the web analyzer. In some embodiments, the IPS may have a proprietary implementation of a persistent queue. The queue may be stored in a memory and may point to constructed files. This pointer may provide communication between the IPS and the web analyzer. In other embodiments, the IPS and web analyzer may communicate via a queue based technology style, such as, Microsoft Message Queuing (MSMQ) and/or RabbitMQ.

Recording, Storage and Playback

Reference is made to FIG. **18**, which schematically illustrates a system **1800** for recording a user's web interactions in accordance with an embodiment of the invention.

System **1800** may include a web server **1802** (e.g., web server **122** of FIG. **1**), a capture server **1804** (e.g., capture server **110** of FIG. **1**) including a probe **1806** and an NIC **1808** (e.g., probe **410** and NIC **408** of FIG. **4**) connecting web server **1802** and capture server **1804**. System **1800** may include an interaction center server **1810** (e.g., interaction center **124** of FIG. **1**) including an IPS **1822** (e.g., IPS **412** of FIG. **4**) for receiving user web interactions from capture server **1804** and transferring it to storage **1832** (e.g., database **126** of FIG. **1**), a call server **1812** (e.g., at interaction center **124** of FIG. **1**) having a CAPI host **1814**, a database server **1816**, a web analyzer **1818** (e.g., analysis server **116** of FIG. **1**) including a CAPI **1812** for connecting web analyzer **1818** to call server **1812**. System **1800** may include a server **1828**, such as a structured query language (SQL) server, connected to a capture database **1824** (e.g., capture database **416** of FIG. **4**) storing interaction metadata and a server **1830** connected to an interaction database **1826** storing the interactions content.

System **1800** components may execute the following operations (other or additional operations may also be used):

In operation **1841**, probe **1806** may capture web server **1802** traffic via the web server's NIC **1808**.

In operation **1842**, probe **1806** may send the captured traffic to IPS **1822**, for example, in data packets.

In operation **1843**, IPS **1822** may analyze the packets by reconstructing the captured web pages and embedding file ID links to external files, saving metadata to capture database **1824** and/or saving the web page files to storage **1832**.

In operation **1844**, web analyzer **1818** may sample capture database **1824** and search for new events that have not yet been processed.

In operation **1845**, for each event identified, web analyzer **1818** may:

- Identify whether the new events are associated with a new session or not, for example, by searching for the session ID of the event in the memory cache objects of web analyzer **1818**.
- If the new events are associated with a new session, web analyzer **1818** may:
  - Create the relevant session object and add all pages of this session as references to that object once the new pages are received.
  - Extract the customer identifier from the web cookie.
- Each new page identified in capture database **1824** may be sent to web analyzer **1818** for analysis, for example, as follows:
  - For the first page of the session: Find the web site project that this page is part of, e.g., based on the domain part of the page URL.
  - Check if this page should be extracted—e.g., if the page's URL/title/url+title is defined in the web site project pages.
  - If the page is defined:
    - Locate where the page is saved in storage **1832** as indicated in capture database **1824**.
    - Load the HTML file from storage **1832** to a DOM.
    - Search for elements that are defined as screen elements for this page:
      - each screen element may be defined with a set of properties, for example, in tblWASEProperty. Properties may include, for example:
        FindByID—some_id
        FindByName—some_name
        FindByXPath—DIV[1]\DIV[2]\TABLE [1]\ . . . .
      - If a screen element is defined by all or multiple of these properties, then a matching screen element in the HTML may match all or multiple of these properties.
    - Each screen element found in the web page may have data extracted, for example, based on the nvcValuePopperty in tblWAScreenElement.
  - If a customer identifier is not extracted from the cookie and there is a screen element in the page that is of type customer ID, the screen element may be extracted as described above.
  - If this page is specified to be saved to interaction database **1826** (e.g., indicated in the configuration scheme or a flag turned on that determines recording all pages), the page metadata (and extracted data) may be saved in the cache memory referenced to the associated session object.
  - Update the page's URL: concatenate the URL of the page as retrieved from capture database **1824** with the fileID, for example, to enable playback from FAS proxy.

In operation **1846**, after a predetermined time interval of inactivity (e.g., 15 minutes), web analyzer **1818** may close the current session. Web analyzer **1818** may create CAPI web objects and via CAPI **1820** may request to insert the closed session interactions into interaction database **1826**, for example, after adjusting their end time (−15 minutes).

In operation **1847**, CAPI Host **1814** may resolve the customers of the interactions based on their web login identifier (e.g., executed as a bulk operation for many interactions).

In operation **1848**, CAPI Host **1814** may send a request to database server **1816** to store the interactions in interaction database **1826**.

In operation **1849**, database server **1816** may store the interactions in interaction database **1826**.

Other operations or orders of operations may be used. Components and processes of FIG. **18** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **18** may be, for example, software executed on one or more processors.

Reference is made to FIG. **19**, which schematically illustrates a system **1900** for archiving a user's web interactions in accordance with an embodiment of the invention.

System **1900** may include a database **1902** (e.g., database **126** of FIG. **1**) for archiving or storing user's web interactions, a storage center module **1904** (storage centers **118** of FIG. **1**) including a storage center (SC) server **1920**, streaming server (SS) **1918** and FAS **1916** (for playback storage), each managing the storage of data in database **1902**. System **1900** may include a rule engine **1906** to search for a list of web interactions that match a query or satisfy filters, a rule manager **1908** to define storage rule for web interactions and web analyzer **1910** (e.g., analysis server **116** of FIG. **1**) to provide information to configure the storage of database **1902**. System **1900** may include a local storage **1912** and a long term storage **1914** for storing files (e.g., image files) associated with the web interactions.

In operation **1941**, once a web session terminates, web analyzer **1910** may insert new web session recordings into database **1902**. Web analyzer **1910** may send a single file including the web pages of the session to database **1902** (e.g., as a single zip file) and may save the file path (e.g., in tblRecording).

In operation **1942**, rule manager **1908** may insert storage rules into database **1902** to apply to web interactions. Rule manager **1908** may set the storage destination either to file system storage in the network or to an external storage device.

In operation **1943**, rule engine **1906** may retrieve web interactions to which the storage rules apply and may update database **1902** with the retrieved web interactions and may inform storage center **1904** to archive those interactions.

In operation **1944**, storage center **1904** may search database **1902** for the relevant web interactions (e.g., inserted by rule engine **1906** according to the rules in rule manager **1908**) by the recording path (e.g., as written in tblRecording).

In operation **1945**, SC **1920** may send SS **1918** data to locate the relevant web interactions to be archived.

In operation **1947**, when a playback request is received, SS **1918** may check if the interactions data is still stored in local storage **1912**. If so, a processor or process may proceed to operation **1946**; otherwise a processor or process may proceed to operation **1948**.

In operation **1946**, playback may be performed streaming data from local storage **1912** using FAS **1916**.

In operation **1948**, playback may be performed using data from long-term storage **1914**.

In operation **1949**, SC **1920** may update database **1902**.

Other operations or orders of operations may be used. Components and processes of FIG. **19** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **19** may be, for example, software executed on one or more processors.

Playback and storage configurations may be highly coupled since the way in which web page resources are saved may affect the way in which they are played. Playback and storage configurations may include, for example, multipurpose Internet mail extensions (MIME) HTML or MHT files, image files, zipped text, and local files (other or additional playback and/or storage configurations may also be used).

For an MHT file storage configuration, an MHT file may be stored, for example, for each web page. The IPS may generate the web page file as an MHT file (e.g., instead of using the FileID link in the HTML). The MHT file may be identified, for example, by file ID and/or special file type. In one example, the web analyzer may set a file field (e.g., tblRecording) with the file ID of the MHT file for each page. In such cases, the SC may simply copy the MHT files of the pages that are analyzed from local storage **1912** to long term storage **1914**. Once the MHT file is copied, the SC may modify tblRecording to point to the MHT page in long term storage **1914**. For the playback of MHT files, the web player may use SS **1918** to stream the MHT file. SS **1918** may either put the MHT file on a web browser control (e.g., there are no external links to the file so there is no need to set the proxy) or may transform the MHT file to an image on the client side. SS **1918** may reside in multiple servers and may be load balanced. In this solution, there may be no difference between playback of archived and non-archived calls. Like archived calls, non-archived calls may also be in the MHT format and may be streamed using SS **1918** from the local storage.

For an image storage configuration, an image may be created for each web page in the archiving flow (e.g., not by SC **1920** itself but by a dedicated component, such as, a dynamic-link library (DLL) (code library), that SC **1920** uses to create the image). During the archiving flow, web analyzer **1910** may indicate the storage location of the resources and/or files for each page in the web interaction to SC **1920**. The location data may be stored, for example, in the FileEvents/http and File tables, in a database **1902**. SC **1920** may receive HTML data from FAS **1916** after setting the proxy. SC **1920** may then generate an image and save the image in long terms storage **1914**, thus updating the file ID field entries (e.g., in tblRecording) to point to the image file location in the long term storage. In one embodiment, the generation of the image may only come after the posts have been inserted into the page. In such embodiments, the images may remain uncompressed (compression may be used for textual resources). Transforming the HTML file to an image file may use client side components at the server side. For an image playback configuration, a different flow may be used to playback archived and non-archived calls, for example, as described in reference to FIGS. **20** and **21**. Non-archived calls may be played through a player service (e.g., playback streaming) using FAS **1916**. FAS **1916** may read the file locations from the capture database and may stream the files from their local storage **1912**. If the pages have been through retention, e.g., saving recordings for some time period, then they may not be played. Posts may be built by the playback streaming service before displaying the HTML. In another embodiment, the player flow may be operated directly from the client side to FAS **1916**. In contrast, archived calls may be played through SS **1918** from their long term storage **1914**. In some embodiments, there may be no need to build the posts as they are part of the image. Using images may be problematic for enabling retroactive analysis of web pages. Once an image is created and the original files go through retention, it may be difficult to support capabilities, such as, retroactive/discovery analysis. To enable retroactive/discovery analysis, both the images and the original files may be saved. However, such embodiments may increase the storage volume and may also depend on configuring FAS **1916** to work with the current system storage and database **1902**.

For a compressed (e.g., "zipped") text storage configuration, SC **1920** may copy all the page resources from their local storage **1912** to long term storage **1914** and may aggregate them to a single folder/zip file. The compression in this case may be useful since the resources include textual files such as CSS, JS, JSON and HTML, of which the size may be significantly decreased by compression. For playback of the zipped text file, a different flow may be used to playback archived and non-archived calls, for example, as described in reference to FIGS. **20** and **21**. Non-archived calls may be played through a player service (e.g., playback streaming) using FAS **1916**. FAS **1916** may read the file locations from the capture database and may stream the files from their local storage **1912**. If the pages have been through retention, then they may not be played. Posts may be built by the playback streaming service before displaying the HTML. In another embodiment, the player flow may be operated directly from the client side to FAS **1916**. Archived calls may also be played through playback streaming (or directly from the client) against FAS **1916** from their long term storage. If all the original interaction data (e.g., html files, xml files, image files, etc.) is saved in long term storage **1914**, to playback the interaction data, the FAS may transform the separated files into a composed HTML. FAS **1916** may be enhanced in order to find resources according to their location in an interaction database (e.g., instead of a capture database). FAS **1916** may include a map from the old fileID to the location of the file in the long term storage **1914**. Since the file might be compressed, FAS **1916** may also be able to uncompress and retrieve the file. Posts may be built by the web player and/or SS **1918** before displaying the HTML. Such embodiments may enable retroactive/discovery analysis of web pages.

For a local file storage configuration, instead of embedding calls to FAS **1916** in the HTML for downloading resources of the page (e.g., where Href=http://FASLocation\FileIDX), a link may locate a file system (Href=localFileLocation:\FileIDX). Accordingly, the IPS may embed the links using a file system pointer. Similar to the zipped text storage configuration, SC **1920** may copy all the page resources from their local storage **1912** to long term storage **1914** and may aggregate them to a single folder/zip file. The compression in this case may be useful since the resources include textual files such as CSS, JS, JSON and HTML, of which the size may be significantly decreased by compression. Playback of the local files may be identical for archived and non-archived calls. The only difference is that the files for archived and non-archived calls may be located in different places (e.g., as defined in tblRecording). The SS **1918** may stream all the page files to the web client player local file system, and the player may load the main HTML page into a web browser control, after it will embed the posts.

To store web media, archiving rules may define rules for archiving web. Rule engine **1906** may collect the interactions that match the archiving filter criteria for storage center **1904**. If the archiving of an interaction matches the rule definition, all files generated by the IPS for that session may be stored, for example, using one of the four alternatives formats described above.

Reference is made to FIGS. **20** and **21**, which schematically illustrate systems **2000** and **2100** for playback of non-archived and archived web interactions, respectively, in accordance with embodiments of the invention.

Systems **2000** and **2100** may include an interaction center server **2002** (e.g., interaction center **124** of FIG. **1**), an agent

workstation **2006** (e.g., agent device **120** of FIG. **1**) including a client web player **2008** and a PO client **2010**, and an interaction database **2014** (e.g., database **126** of FIG. **1**) operated by a database server **2016**. Interaction center server **2002** in system **2000** may include a web playback client **2018** and a FAS **2004**, while interaction center server **2002** in system **2100** may include an SS **2020**. System **2000** may include a local storage **2012**, while system **2000** may include a long term storage **2022**.

In FIG. **20**, system **2000** components may execute the following operations to playback non-archived web interactions (other or additional operations may also be used):

In operation **2041**, agent workstation **2006** operating a real-time guidance module may select a playback button or functionality, for example, using a PO client **2010**. PO client **2010** may request client web player **2008** to play an interaction with some interaction ID.

In operation **2042**, client web player **2008** may send the interaction ID to web playback client **2018**.

In operation **2043**, web playback client **2018** may query interactions database **2014** to retrieve interaction data associated with the interaction ID. Web playback client **2018** may transform the retrieved data from interactions database **2014** to a web object (e.g., UnifiedWebData) and may return the web object to client web player **2008** in operation **2047**.

In operation **2044**, web playback client **2018** may send HTTP data to FAS **2004** using the web object, for example, for the first page URL from tblWebInteractionPagesXX. Web playback client **2018** may redirect the call to the web proxy, which may load the HTML file from their storage location and may load the linked files from their location. The merged HTML may be returned to the web client.

In operation **2045**, FAS **2004** may send local storage **2012** the retrieved interaction data for storage.

In operation **2046**, web playback client **2018** may process the interaction data, for example, transforming a webpage for playback into an image and sending the processed data to PO client **2010**.

In operation **2047**, web playback client **2018** may receive the following data for playback:

Customer name.

Web interaction metadata, including:

1. Time of the interaction.
2. List of pages and their data extraction.

For each page: a URL, e.g., as saved in tblWebInteractionPagesXX. This URL may include the web file ID from capture database, which may be requested by FAS **2004**.

In operation **8**, client web player **2008** may load the in-memory HTML to a DOM and may search for elements input by the customer. The search may be based on an events table, where, for example, each post event may include an Xpath of the element, the element may be searched on the DOM, and the element may be set to the value in the events table. Client web player **2008** may then create web browser controls and may populate the web browser with the in-memory reconstructed HTML. Client web player **2008** may then display the web browser control and populate a web page summary pane.

FAS **2004** proxy may be responsible for accessing storage **2012** and constructing the HTML page with embedded links. For example, if there is a link to a java script (JS) file in the HTML, FAS **2004** may read the file ID in the link, find its file path in a capture database, load the JS file, embed the JS file into the HTML file, and download the embedded HTML file back to client web player **2008**.

In contrast to FIG. **20**, in FIG. **21**, system **2100** may play archived calls through SS **1918** from their long term storage **2022**. In one embodiment in FIG. **21**, client web player **2008** may send an interaction ID of the desired web interaction to SS **2020**. SS **2020** may load the interaction metadata associated with the interaction ID. Using the retrieved metadata, SS **2020** may load the interaction data associated with the retrieved metadata from long term storage **2022** and may stream the interaction data to client web player **2008** for playback.

Other operations or orders of operations may be used in FIGS. **20** and **21**. Components and processes of FIGS. **20** and **21** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIGS. **20** and **21** may be, for example, software executed on one or more processors.

When using an image file format, SS **2020** may be used to stream the image and display it on an image control instead of a web browser control. Similar adjustments may be used for MHT file formats. In another embodiment, FAS **2004** may fully control the adjustments used for playback when the interaction files are archived and non-archived.

Embodiments of the invention may include, for example, one or more of the following adaptations or improvements (other or additional adaptations or improvements may also be used):

IPS enhancements to support MHT/local files.

FAS **2004** adjustments to support working with storage **2012**, **2022** and database **2014**.

Player enhancements to support image/MHT/local files.

SC archiving.

SC transformation of HTML to image files in the server side, for example, using non-client side components.

FAS **2004** scale improvements (since FAS **2004** may be accessed more frequently in some embodiments) and scale out.

SS **2020** scale out.

Client web player **2008** may include a user interface, for example, for an agent to view user interactions at agent workstation **2006**. The user interface may include enhancements, for example, to change the way the page summary is displayed, such as, to a hierarchy or tree-structured view. In some embodiments, extracted information or values may be displayed in a key-value summary view, and the hierarchy of the elements may be reflected by concatenating the element names. In one example, a web page may include the following objects:

Product
  Name
  Price
Street
  Name
  City

The web player user interface may display the objects, for example, as shown in Table 1:

TABLE 1

Web player user interface display

Key	Value
Product Name	iPhone
Product Price	30
Product Name	xBox
Product Price	60

TABLE 1-continued

Web player user interface display	
Key	Value
Street Name	Broadway
Street City	New York

Embodiments of the invention may process open (e.g., ongoing/unresolved) calls according to one or more of the following embodiments (other or additional embodiments may also be used):

1. Open calls may be managed, for example, in a distributed cache. The web analyzer may populate the distributed cache with open sessions and may remove sessions from distributed cache when the session ends.
   The web analyzer may use a distributed cache wrapper component. The web analyzer may also provide in-process DLL for the registering new pages/posts.
   In such embodiments, interactions may be stored in database **2014**, which may be managed by the database server **2016** (e.g., instead of a call server **1812** of FIG. **18**).
2. Interaction center server may hold open calls. The calls may be registered using a monitor server in the interaction center server (e.g., if monitor server supports scale out).
3. Open calls may be managed in the distributed cache. Registration and events may be managed through the call server/monitor server. Both client web player **2008** and PO client **2010** may use open session data and ongoing pages that the customer visits. Since both of these client devices use the events data, one solution may send the events data to PO client **2010** and another may send the event data to client web player **2008** (this may avoid sending each event twice to each agent workstation **2006**). In some embodiments, events may only be registered and sent for customers that are currently in an ongoing web session and/or on the phone with an agent. In some embodiments, some events may only include metadata and not the HTML data, for example, if the page is only relevant for the shadow browsing.

To support shadow browsing, events may be registered in one of the following alternative embodiments, or other embodiments:

1. A connection server (e.g., connection server **424** of FIG. **4**) may register open calls for a customer X, for example, using a web analyzer DLL. The web analyzer DLL may propagate events to the connection server. The web analyzer may operate in conjunction with the distributed cache.
2. The connection server may register open calls of the customer X against the monitor server. Monitor Server may register against the interaction center server. Events may be routed in a path through the interaction center server to the monitor server to the connection (in the forward and reverse path direction). Such embodiments may use monitor server scale out.

When shadow browsing, new pages visited by the customer and posts events (posts may only be relevant for the shadow browsing) may be propagated as events to PO client **2010**, for example, to re-evaluate rules. In some embodiments, client web player **2008** may include a configuration option to indicate whether or not to shadow browse pages that are not defined in the configuration rules. In some embodiments, a default setting may send all page events to PO client **2010** and may update client web player **2008** accordingly.

Shadow browsing may provide a web page based streaming and playback mechanism. PO client **2010** may receive the current page metadata and may aggregate all the metadata for pages in memory. To shadow browse, HTML data may also be retrieved. When PO client **2010** receives a new event, PO client **2010** may notify client web player **2008**. The event may include an open interaction ID, session ID and/or event page ID. Client web player **2008** may invoke SS **2020** requesting the HTML of the page ID of the interaction. SS **2020** may invoke the client web analyzer DLL, which may return a URL and file ID for the page. To increase the speed of HTML retrieval, client web player **2008** may retrieve HTML data directly via FAS **2004** and may avoid generating images for the HTML.

Reference is made to FIG. **22**, which schematically illustrates a system **2200** for shadow browsing a user's web interactions in accordance with embodiments of the invention.

System **2200** may include an interaction center server **2002** (e.g., interaction center **124** of FIG. **1**) having a web analyzer **2034** (e.g., analysis server **116** of FIG. **1**), an agent workstation **2006** (e.g., agent device **120** of FIG. **1**) including a client web player **2008** and a PO client **2010**, and an application server **2036** (e.g., analysis server **116** of FIG. **1**) operating a monitor server **2038** including a CAPI **2040**, a playback administrator **2042**, a playback streamer **2056**, and/or a SS **2020**. System **2200** may also include a local storage **2012** (e.g., provided via an IPS **1822**) and a long term storage **2022**.

System **2200** components may execute the following operations to playback web interactions in real-time, e.g., "shadow-browse" (other or additional operations may also be used):

In operation **2241**, agent workstation **2006** operating a real-time guidance module may select a playback button or functionality, for example, using a PO client **2010**. The real-time guidance module may launch client web player **2008**, for example, by transferring the systemAdminURL and interaction ID to playback administrator **2042** for playback.

In operation **2242**, client web player **2008** may initialize and authenticate a user, for example, by using an active directory and/or a login service. The user authentication may provide a valid token.

In operation **2243**, client web player **2008** may send monitor server **2038** an interaction ID for the web session, request monitor server **2038** to fill a web object (e.g., ExtendedCallData) with the open web session details, such as, a recording path, pages captured so far, topics, etc.

In operation **2244**, monitor server **2038** may call web analyzer **2034**, e.g., via CAPI **2040**, to fill the web object from its memory based on the interaction ID. Web analyzer **2034** may return the relevant data to monitor server **2038**.

In operation **2245**, monitor server **2038** may build and return the web object to client web player **2008**. The web object may include data for a current (or most recent) page the customer is browsing.

In operation **2246**, client web player **2008** may call playback administrator **2042** to receive a play list, for example, including the web object.

In operation **2247**, playback administrator **2042** may send a path of the page zip file that holds the page held in the web object to playback streamer **2056**. Playback streamer **2056** may return a target URL to where the page may be streamed.

In operation **2248**, playback administrator **2042** may return one or more of the following to client web player **2008**:

Open session metadata (e.g., customer name, date, etc.).

Requested pages with file names.

Page metadata (e.g., topic, data extraction, etc.).

URL of a folder in a virtual directory **2048** that playback streamer **2056** creates for this page.

In operation **2249**, playback streamer **2056** may call SS **2020** (e.g., asynchronously) to request the file containing the pages (e.g., zipped or otherwise compressed) be transferred from local storage **2012** to a local path, for example, as defined in a virtual directory **2048**

In operation **2250**, SS **2020** may stream the file containing the pages to the virtual directory **2048** path.

In operation **2251**, playback streamer **2056** may uncompress (e.g., "unzip" or use another process) the file if necessary, and may transfer the file contents (e.g., HTML content and images and links in the page) to the URL virtual directory **2048** folder created for this page.

In operation **2252**, client web player **2008** may continually try to playback the page, for example, until client web player **2008** receives an indication from playback streamer **2056** that the URL is ready. Client web player **2008** may create a web browser control, e.g., passing it the URL of the current page, and may display the current page. In order to playback the next page, client web player **2008** may repeat operations **1-5** to continue pulling page data via monitor server **2038**. If client web player **2008** receives a new page (e.g., in the ExtendedCallData object), client web player **2008** may repeat operations **2246-2252** to playback the new page.

Other operations or orders of operations may be used. Components and processes of FIG. **22** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **22** may each be, for example, software executed on one or more processors.

In one embodiment, PO client **2010** may initiate shadow-browsing, e.g., as described in reference to FIG. **22**, while in other embodiments, web analyzer **2034** may initiate shadow-browsing, for example, by sending real-time events to client web player **2008** through via monitor server **2038**.

Client web player **2008** may be launched by real-time guidance or shadow browsing functionality, for example, an agent selecting a playback button in operation **1** of FIG. **22**. However, before client web player **2008** actually displays the web pages, the user may be authenticated. Client web player **2008** may authenticate a user, for example, as follows:

1. Initialize a time resolver
2. Use a login helper to authenticate.
   - 2.1 The login helper may retrieve the authentication mode from a system administrator.
   - 2.2 If the authentication mode is a single sign on (SSO) (e.g., the authentication of the user uses the active directory), the login helper may authenticate against the SecuredLoginService and then receive an authentication token.
   - 2.3 If the authentication mode is native authentication mode:
     - 2.3.1 A user-password login page may be displayed to the user.
     - 2.3.2 The login helper may receive the user-password and may hash the password and send it to the login service, which may authenticate and generate the authentication token.

Reference is made to FIG. **23**, which schematically illustrates a system **2300** for an agent to provide real-time guidance in accordance with embodiments of the invention.

System **2300** may include an agent workstation **2006** (e.g., agent device **120** of FIG. **1**) including a PO client **2010**, an application server **2036** operating a connection server **2050** and a business analyzer **2052**, and an interaction center server **2002** (e.g., interaction center **124** of FIG. **1**) having a web analyzer **2034** (e.g., analysis server **116** of FIG. **1**) having a customer DDL interface **2054**. System **2300** may also include a database **2014** managed by database server **2016**.

System **2300** components may execute the following operations for real-time guidance (other or additional operations may also be used):

In operation **2341**, a customer may browse or log into a web site. The customer may then call a contact center, reaching an agent operating agent workstation **2006**. The agent may write the customer's identifier into a CRM user interface. The customer identifier may be extracted from the CRM user interface and sent to the connection server **2050**, for example, as commanded by real-time interaction rules.

In operation **2342**, connection server **2050** may call web analyzer **2034** and transfer the customer identifier extracted from CRM to web analyzer **2034**. Connection server **2050** may request metadata from web analyzer **2034** associated with this customer's current open session(s) (if any such exist) and/or the customer's customer ID.

In operation **2343**, web analyzer **2034** may activate a stored procedure provided by the customer entity, for example, using customers DLL **2054**. The customer entity may receive the customer identifier (e.g., tenantID) and identity type (e.g., phone) and may return the customer's web identifier and the customer's customer ID.

In operation **2344**, web analyzer **2034** may search for open session for the customer, for example, by searching for the customer's web identifier in the customer's cache.

In operation **2345**, web analyzer **2034** may return metadata from the web session of the customer (e.g., if there is a current open session for the customer) and/or the customer's customer ID to connection server **2050**.

In operation **2346**, connection server **2050** may send business analyzer **2052** the customer ID and may ask for web interactions associated with this customer ID (e.g., only if the real-time interaction rules require metadata for past web interactions).

In operation **2347**, business analyzer **2052** may query database server **2016** to find web interactions in web interaction tables in database **2014** that are associated with this customer ID, for example, over a requested or predetermined time period. Database server **2016** may return any matching interactions to agent workstation **2006**, for example, from business analyzer **2052** to connection server **2050** and from connection server **2050** to PO client **2010**.

In operation **2348**, connection server **2050** may return web interactions associated with this customer ID to agent workstation **2006**.

Other operations or orders of operations may be used. Components and processes of FIG. **23** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **23** may each be, for example, software executed on one or more processors.

Web analyzer **2034** may be integrated with a capture server (e.g., capture server **110** of FIG. **1**) by pulling data for new web pages from an interaction database **2014**, for example,

periodically or every (N) seconds. Web analyzer **2034** may be responsible for managing sessions and performing data extraction.

Capture servers may include a probe (e.g., capture server **410** of FIG. **4**) and an IPS (e.g., IPS **412** of FIG. **4**), which may be configured, for example, as follows (as with other modules discussed herein, other languages, operating systems, and configurations may be used):

Probe:
- Runs or executes on Linux/written in c++ (other program language(s) may be used).
- Runs scripts to allow filtering URLs (e.g., default filtering of URLs may be based on domain name system (DNS) requests which may be captured by the probe during the runtime).
- Filters based on URL, IP and/or host name.
- Uses a time delay (e.g., default value=20 seconds) before transferring packets to IPS. Such embodiments may allow late matching of packets, for example, when the value used by a filter arrives with one of the following packets.

IPS:
- Written in c++ (other program language(s) may be used).
- Supports network capture mechanism.
- If network capture is used the network capture may be executed only on one thread.

General capture configuration (other configuration(s) may be used):
- Relate all files of the same page (HTML, images, java scripts, etc.)
- Option 1:
  - Save each main page in its own folder.
  - Save all files related to the main page in the same folder as a main page.
  - Replace all links inside the main page with a relative path to the files located in the same folder.
- Option 2:
  - Save the main page with all its content, for example, as an MHT file.

Integration of Third Party Customer Experience Management (CEM)

Some embodiments of the invention may use a third-party service or server (e.g., such as, the TeaLeaf™ CEM) to provide customer experience management (CEM) functionality instead of using a native system device (e.g., such as, the PO Designer).

Reference is made to FIG. **24**, which schematically illustrates a system **2400** integrating a third-party CEM server **2412** in accordance with embodiments of the invention.

System **2400** native components may include an agent workstation **2406** (e.g., agent device **120** of FIG. **1**) including a PO client **2410** and a client web player **2408**, an application server **2420** operating a connection server **2424** and an insight manager **2422** (e.g., insight manager **1310** of FIG. **13**), an interaction center server **2416** (e.g., interaction center **124** of FIG. **1**) having a web analyzer **2418** (e.g., analysis server **116** of FIG. **1**), and an interactions database **2414** (e.g., database **126** of FIG. **1**). System **2400** non-native components may include a web server **2402** (e.g., web server **122** of FIG. **1**) used by a customer **2404** (e.g., at user computer **102** of FIG. **1**) viewing web server content and a third party CEM server **2412**.

CEM server **2412** may be responsible for capturing and extracting web sessions, replaying sessions, and/or archiving sessions. To integrate CEM server **2412**, system **2400** may import CEM server **2412** configured (e.g., by a third party HTTP based designer) that is compatible with system **2400**. In one embodiment, the division of labor may allow native devices to retrieve the sessions' metadata and perform categorization on top of (OTO) the retrieved sessions. For example, a native PO designer may define web monitoring rules and these rules may be based on the session topics extracted by CEM server **2412**. CEM server **2412** may provide an application programming interface (API) for native components of system **2400** to interact with non-native CEM server **2412**. For example, a CEM **2412** API may be used to retrieve a list of web site areas and session attributes defined in CEM server **2412**. This list may appear, for example, in one or more of the following devices:

1. Insight manager **2422** web filters, for example, when defining a category.
2. Business analyzer web filters, for example, when defining a query.
3. PO designer, for example, when defining a rule for real-time guidance based on web events.

For example, if CEM server **2412** is extracting "products purchased" screen elements, then "products purchased" may be a filter in the above 3 applications.

Embodiments of the invention may import the configuration from CEM server **2412** into native system **2400** components Importing the CEM server **2412** configuration may, for example, include a definitions project and consumption project, where the definitions project may be correlated to the imported configuration to define rules on the CEM server **2412** configuration scheme.

Web analyzer **2418** may periodically retrieve web sessions from CEM server **2412** and save them to interaction database **2414**, for example, via a CAPI (e.g., CAPI **1820** of FIG. **18**) and database server (e.g., database server **2016** of FIG. **23**). Web analyzer **2418** may include a designated connection server to connect to CEM server **2412** or alternatively, may use an all purpose connection server. This connection server may periodically call the CEM **2412** API for batch retrieval of offline sessions that took place from a time the previous batch was loaded until a current time. The connection server may verify that sessions retrieved from CEM server **2412** are not duplicates. In one example, by the connection server may query CEM server **2412** for interactions (e.g., in the current set only) that have an original session ID column equal to the session ID received from CEM server **2412**. If the connection server detects a match in IDS, the associated interaction(s) may be discarded/not inserted.

Components and processes of FIG. **24** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **24** may each be, for example, software executed on one or more processors.

Reference is made to FIG. **25**, which schematically illustrates a system **2500** having an integrated CEM server **2412** retrieving a plurality of offline web sessions in accordance with embodiments of the invention.

System **2500** native components may include an interactions database **2414** (e.g., database **126** of FIG. **1**) and an interaction center server **2416** (e.g., interaction center **124** of FIG. **1**) including a database server interface **2432**, a database server **2426**, and a web analyzer **2418** (e.g., analysis server **116** of FIG. **1**) having a CAPI **2428** and a plug-in connection server to interact with CEM server **2412**. System **2500** non-native components may include a web server **2402** (e.g., web

server **122** of FIG. **1**), CEM server **2412** and CEM storage **2430** for storing web interactions.

System **2500** components may execute the following operations for retrieving a batch of offline web interactions (other or additional operations may also be used):

In operation **2541**, web analyzer's **2418** connection server plug-in may periodically request offline web interactions from CEM server **2412**, for example, in batches or groups of web sessions or interactions. The connection server plug-in may send CEM **2412** the time of the last loaded session to avoid duplicate session transmission.

In operation **2542**, CEM server **2412** may send web analyzer **2418** web session data from CEM storage **2430**, for example, that were captured from a time after the last loaded session to the current time. In one example, only metadata may be imported. However, alternatively or additionally, entire web sessions, links, tags, embedded objects, and/or screen elements from sessions may be imported.

In operation **2543**, web analyzer **2418** may use a local CAPI **2428** client API to insert a batch of web interactions in interactions database **2414**, for example, by sending the structured web interactions metadata retrieved in operation **2** to database server **2426**.

In operation **2544**, database server **2426** may insert the web interactions into interactions database **2414**.

Other operations or orders of operations may be used. Components and processes of FIG. **25** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **25** may each be, for example, software executed on one or more processors.

Reference is made to FIG. **26**, which schematically illustrates a system **2600** for playback of the offline web interactions retrieved in FIG. **25** in accordance with embodiments of the invention.

System **2600** native components may include an agent workstation **2406** (e.g., agent device **120** of FIG. **1**) including a PO client **2410** and a client web player **2408**, an application server **2420** operating a playback administrator **2436** and a business analyzer **2438**, and an interactions database **2414** (e.g., database **126** of FIG. **1**) operated by a database server **2426**. System **2600** non-native components may include a CEM server **2412** operating a CEM service **2440**.

System **2600** components may execute the following operations for playback of a batch of web interactions retrieved offline (other or additional operations may also be used):

In operation **2641**, agent workstation **2006** operating a real-time guidance module may select a playback button or functionality, for example, using a PO client **2010**. The real-time guidance module may launch client web player **2008**, for example, by transferring the systemAdminURL and interaction ID to playback administrator **2042** for playback.

In operation **2642**, client web player **2008** may initialize and authenticates a user, for example, by using an active directory and/or a login service. The user authentication may provide a valid token

In operation **2643**, client web player **2008** may send playback administrator **2436** the interaction ID to playback.

In operation **2644**, playback administrator **2436** may send a request to business analyzer **2438** to fill a web object (e.g., ExtendedCallData) from database **2414** based on the interaction ID. Business analyzer **2438** may fill the web object with the web interaction metadata, such as, a recording path, pages captured so far, topics, etc.

In operation **2645**, business analyzer **2438** may fill the web object from database **2414** based on the interaction ID. Business analyzer **2438** may return the relevant data to playback administrator **2436**.

In operation **2646**, playback administrator **2436** may return the web object to client web player **2008**.

In operation **2647**, client web player **2008** may resolve the internal session ID from the data set and may invoke CEM service **2440** for session replay. Client web player **2008** may receive a web response from CEM server **2412**, create a web browser control, and load a response to web browser control.

Other operations or orders of operations may be used. Components and processes of FIG. **26** may be executed using devices and processors of FIG. **1**, such as, for example, web capture server **110**, analysis server **116**, agent device **120**, interactions center **124** and their processors **112**, **132**, **136** and **142**. Components of FIG. **26** may each be, for example, software executed on one or more processors.

To playback online or ongoing web interactions, embodiments of the invention may use a dedicated CEM **2412** API for real-time or ongoing session replay, which may receive the CEM **2412** internal session ID. The session internal ID may be stored in a native web interactions table.

The online web API may be invoked for playback, for example, when the agent is on a call with a customer. The following provides an example configurations for a system adapted to provide native web playback of online web interactions from a non-native CEM:

1. Non-native configurations may be integrated in a native interaction center, for example, via an application or plug-in. The plug-in may map relevant configuration options and move them to manageable locations.
2. After configuration changes, the system, in one embodiment, should not be re-started.
3. Configuration file parameters may be moved to a database.
4. Capture components may be defined (e.g., such as the FAS and storage manager) as part of the plug-in, for example, so that they may be routed and monitored via a native monitoring device or sentinel.

To monitor the web analyzer, the web analyzer may report on performance counters. Web analyzer may support component failover and DC failover for system resiliency. During component failover, a standby web analyzer may become active automatically when deployed on a local/geo cluster. A cluster may provide failover and increased availability of applications and a geo cluster may be enhanced to provide resiliency of applications across different data centers. At least until web analyzer supports an active-active resiliency mode, it may work in an active-standby resiliency mode. An active-active resiliency mode may run or execute a service in multiple server instances in order to achieve both higher scale and increased availability. An active-standby resiliency mode may run or execute only one service instance and hold another installed service instance in a standby mode. Such a mode may provide high availability, for example, if the active service becomes unavailable the standby service may become active instead. Such systems may use a high availability manager (HM) and/or a deployment Manager (DM).

System components and features for recording, storage and playback may include, for example, any combination of the following components (other or additional components may be used):

1.1. IPS (e.g., IPS **412** of FIG. **4**) may, for example:
Provide direct communication with web analyzer.
Include IPS enhancements to support MHT/local files.

1.2. FAS (FAS **1916** of FIG. **19**) may, for example:
Provide FAS scale improvements (e.g., the FAS may be more frequently accessed) and scale out.
Provide FAS adjustments to support working with an interaction storage and database (e.g., database **422** of FIG. **4**).
1.3. Web analyzer (e.g., analysis server **116** of FIG. **1**) may, for example:
Use direct communication with the IPS.
Support new event distribution solution for real-time guidance workflow (e.g., open sessions analysis may use a distributed cache and/or interaction center).
Move all configuration file parameters to the database.
Support scale out.
Support versioning of web configuration projects, e.g., reflecting a PO designer version of these projects in the database.
Provide Regex per screen element, e.g., where Regex is a language that enables sub-strings to be identified inside text.
Provide combo box extraction, e.g., by providing a control that enables a selection from a drop down menu.
Provide multiple customer ID screen elements.
Provide a CEM open session flow API (e.g., where web analyzer may manage CEM open sessions API).
Support reading recording rule definitions, for example, including a tenant ID and virtual agent.
Not re-start the system after configuration changes.
For monitoring, add performance counters and SNMP traps to alert the web analyzer when there are errors in the system.
1.4. Interaction center (e.g., interaction center **124** of FIG. **1**) may, for example:
Provide event distribution solution for the real-time guidance workflow and may store and/or manage an open or ongoing sessions repository or database (e.g., ongoing sessions database **538** of FIG. **5**).
If distributed cache is chosen and not the interaction center for the open calls, the workflow may be moved to the database server directly.
1.5. Rule manager (e.g., rule manager **426** of FIG. **4**) may, for example:
Support versioning to reflect a PO designer version of projects in the database.
Support a direct API with a PO client and a connection server.
Support web recording rules management.
Support web archiving rules.
Support import of third-party CEM configuration.
1.6. Rule engine (e.g., rule engine **1906** of FIG. **19**) may, for example:
Support web interactions archiving rules.
1.7. Storage center (e.g., storage center **118** of FIG. **1** or **1904** of FIG. **19**) may, for example:
Support web archiving flow (using MHT files, image files, zipped text, and/or local files.)
1.8. Stream server (SS) (e.g., SS **1918** of FIG. **19**) may, for example:
Be used to execute an offline playback workflow (e.g., as described in reference to FIGS. **24-26**), for example, when the stream server is deployed on the application server.
Shadow browse.
Content mask, e.g., hiding or blocking sensitive data such as credit card numbers in a client web player.
Copy/create webpage files in the long terms storage by the SC executing the archiving workflow.
Stream page files from the long terms storage in the playback/shadow browsing workflow.
1.9. Client web player (e.g., client web player **2008** of FIG. **20**) may, for example:
Provide a new user interface.
Provide a new playback workflow, for example, based on the stream server and pages configured as images.
Shadow browse.
Content Mask.
Provide CEM (e.g., for closed and/or open sessions).
1.10. Connection server (e.g., connection server **424** of FIG. **4**) may, for example:
Provide project versions to reflect a PO designer version of projects in the database.
Provide a direct API for a publishing project.
Provide a new flow for retrieving customers' closed and open sessions for real-time guidance workflow.
Publish API from a PO Designer to a rule manager with validation.
Not re-start the system after configuration changes.
For monitoring, add performance counters and SNMP traps. SNMP traps alert the web analyzer when there are errors in the system. Performance counters are numeric counters that applications expose in order to reflect their status, such as, a counter measuring the current number of open sessions.
1.11. Business analyzer (e.g., business analyzer **436** of FIG. **4**) may, for example:
Not re-start the system after configuration changes
For monitoring, add performance counters and SNMP traps (e.g., unless the web real-time guidance workflow does not work with the business analyzer).
1.12. PO Designer (e.g., PO designer **1706** of FIG. **17**) may, for example:
Provide project version.
Provide a direct API for publishing project.
Provide combo box extraction.
Provide a Regex for each screen element.
Provide multiple customer IDs SE.
Import CEM configuration into a definitions project, for example, which may be consumed by a PO client (e.g., PO client **420** of FIG. **4**).
Content Mask definitions for "negative screen elements," which may be blocked from extraction.
1.13. PO Client (e.g., PO client **420** of FIG. **4**) may, for example:
Provide project versions.
Provide events for open web sessions and propagate the events to a web player for shadow browsing.
1.14. Recording agnostics may import interactions recorded using a previous version of the system to a current version of the system, for example by providing:
Support for export of voice interactions.
Support for importing of CEM.
1.15. Server infrastructure may, for example:
Provide a distributed cache wrapper the distributed cache is selected to manage and store the open calls repository and event distribution.
1.16. Monitor server (e.g., monitor server **2038** of FIG. **22**) may, for example:
Support web event types.
Support scale out.
1.17. Interactions database (e.g., database **126** of FIG. **1**) may, for example:
Scheme changes to support versioning.
Support migration.

1.18. Load balancer (possibly for FAS and real-time interaction connect) may, for example:
Support round-robin implementation in which tasks may be assigned to FASs from a list, in order, until the end is reached, after which the order is returned to the beginning of the list.
Support affinity. Load balancing may distribute playback requests among different FAS instances to achieve better scalability for playback. When the requests are distributed, an affinity may be established between each client request and a specific FAS instance, for example, to enable recurrent connections for tasks such as streaming.
1.19. High availability manager (HM) may, for example:
Support failover of web analyzer, for example, by changing the network location of the servers in tbl-SystemResource.
1.20. Deployment manager (DM) may, for example:
Support deploying the web analyzer under a dedicated cluster group (e.g., not the one of the interaction center cluster groups).
Provide distributed cache deployment.
1.21. Sentinel or manager may, for example:
Monitor web analyzer service.
Define and monitor performance counters.
Monitor capture database for back log.
1.22. Distributed cache may, for example:
Provide a distributed cache wrapper.
Provide a distributed cache configuration.

Other or additional devices and features may be used. Each of these devices may be hardware or software executed by devices and processors of FIG. **1**.

System Design

Web monitoring systems may be designed to monitor and report specific data items of a user's web interactions, for example, as defined by a process optimization module, such as, process optimization module **2708** of FIG. **27**.

Reference is made to FIG. **27**, which schematically illustrates a system **2700** for defining the specific data items to monitor in a user's web interactions in accordance with embodiments of the invention.

System **2700** may include a PO designer **2702** (e.g., PO designer **1706** of FIG. **17**) to generate a web analytics solution **2704** defining data items to monitor, a capture server **2706** (e.g., capture server **110** of FIG. **1**) to import information to web analytics solution **2704** for each data item, and a process optimization product **2708** to design which data items to monitor and to manage feedback to the call center agent at real-time.

Process optimization module **2708** may design web analytics solution **2704** to monitor and report data items of a user's web interaction including, for example, session details (e.g., a start time and/or end time for closed sessions), user identity details, a list of webpages viewed during the session, metadata of the webpages viewed during the session, the websites providing the webpages, and/or any other interaction information.

Reference is made to FIGS. **28**A and **28**B, which schematically illustrates file directories **2800** of code libraries **2802** to access data items monitored in a user's web interaction in accordance with embodiments of the invention. File directories **2800** or code libraries **2802** may be provided directly to an agent computer (e.g., agent device **120** of FIG. **1**) for an agent to review raw interaction data or indirectly to the agent, for example, first sent to a web analyzer (e.g., analysis server **116** of FIG. **1**) to process the data and then to the agent computer as a consolidated summary report.

File directories **2800** or code libraries **2802** may include, for example, one or more of the following data items (other or additional data items may also be used):

WebSessionID **2804** may include an abstract class that provides an interface that describes a way which uniquely identifies a web session. WebSessionID **2804** properties may include, for example:
ID—an integer that uniquely identifies the web session.

OpenWebSessionID **2808** may represent a class derived from WebSessionID **2804** class. OpenWebSessionID **2808** may represent the ID of an open web session. In one example, an open web session may be identified by its interaction ID, as opposed to a closed session which may be identified by its session ID.

ClosedWebSessionID **2806** may represent a class derived from WebSessionID **2804** class. ClosedWebSessionID **2806** may represent the ID of a closed web session (e.g., the actually session ID). ClosedWebSessionID **2806** properties may include, for example:
ServerID—an integer that uniquely identifies the server.
SiteID—an integer that uniquely identifies the site.

WebCategoryData **2810** may represent a class that describes a category of data. WebCategoryData **2810** properties may include, for example:
ID—an integer that uniquely identifies the category.
Name—a name of the category.

CustmoerIdentity **2812** may represent a class that describes the identity of a customer entering the web site. CustmoerIdentity **2812** properties may include, for example:
ID—an integer that uniquely identifies the customer. Commonly the value of the ID is taken from the an HTML screen element.
Type—an integer representing the enum value (e.g., a code type which includes several values) of a customer identity type

WebPageMetaData **2814** may represent a class that is a container of the metadata of a web page and may, for example, include the following properties:
EndDate—the date the page was left.
StartDate—the date the page was entered.
Title—the title of the page.

Webpage **2816** may define a class that represents a web page in the site that a customer enters. A user operating a PO Designer may divide this class into subclasses and create a custom web page. Webpage **2816** object may have multiple instances. These instances may be formed if there are repeated visits to the web page and may be stored internally in a list of webpage **2816** objects. Webpage **2816** properties may include, for example:
Instances—a list of webpage **2816** instances.
PageSessions—a collection of WebPageMetaData **2814** sessions.
WebPageMetaData **2814**—the web page metadata of the currently loaded webpage **2816**.

Webpage **2816** functionality may include, for example:
Clear—Clears webpage **2816** data structures, such as, the webpage **2816** instances list and WebPageMetaData **2814** page sessions collection. Arguments (parameters that the functions or functionality may receive as input): None. Return value (parameters that the functions or functionality provide as output): None.

FindWebPage—Retrieves webpage **2816** by searching the instances list for a webpage that matches the specified WebPageMetaData **2814**. Arguments: metadata, e.g., WebPageMetaData **2814** of the desired webpage **2816**. Return value: webpage **2816** object, or null if no match is found.

LoadPage—Loads webpage **2816** object with the object stored in the internal webpage **2816** objects at the passed index argument. Arguments: pageIndx—an integer representing the index in the internal list of the webpage object to be loaded into webpage **2816**. Return value: true if the appropriate webpage **2816** object from the internal list is successfully loaded, false otherwise.

WebSessionMetaData **2818** may represent a class that is a container of the metadata of a web session. WebSessionMetaData **2818** may, for example, include the following properties:

Active—specifies whether the session is active.

CategoriesData—a collection of WebCategoryData **2810** objects.

EndDate—The date the session ended.

StartDate—The date the session started.

WebSessionID—an object that provides the path to the web session ID.

Website **2820** may define a class that represents a website that the customer enters for performing some activities. A customer may enter the site several times. Each of these times may define a distinct session in the website and may be stored in an internal list of website **2820** objects. This class may be an abstract class and may be inherited by the user of the PO Designer to make a custom website that best suites the solution being developed. Website **2820** properties may include, for example:

Domain—The domain of the web site (e.g. www.amazon.com)

Manager—The direct framework manager.

MessageQueue—The direct MessageQueue.

MetaData—a WebSessionMetaData **2812** object that represents the current session metadata.

Sessions—A list of metadata about sessions accessing a specific website.

WebsiteKey—The direct fully qualified name (FQN) of the website **2820** object.

Website **2820** functionality may include, for example:

AsyncLoadCustomerSessionsDataCompleted—An asynchronous callback operation, for example, executed upon completion of a DoWorkOfLoadCustomerSessionsDataAsync operation. AsyncLoadCustomerSessionsDataCompleted may trigger the customer sessions data asynchronous results to be retrieved and the webpage to be loaded. Upon load completion, AsyncLoadCustomerSessionsDataCompleted may send a DataLoaded event. Arguments: asyncResult—defines the status of the asynchronous DoWorkOfLoadCustomerSessionsDataAsync operation. Return value: None.

AsyncLoadRecentCustomerSessionsDataCompleted—An asynchronous callback operation, for example, executed upon completion of the DoWorkOfLoadRecentCustomerSessionsDataAsync operation. AsyncLoadRecentCustomerSessionsDataCompleted may trigger the recent customer sessions data asynchronous results to be retrieved and the webpage to be loaded. Upon load completion, AsyncLoadRecentCustomerSessionsDataCompleted may send a DataLoaded event. Arguments: asyncResult—The status of the asynchronous DoWorkOfLoad RecentCustomerSessionsDataAsync operation. Return value: None.

Clear—Clears website **2820** data structures, e.g., including website **2820** instances list and WebSessionMetaData web sessions collection. Arguments: None. Return value: None.

CreateWebInteractionRequest—Creates an instance of a WebInteractionRequest to be sent to a connection server (e.g., connection server **424** of FIG. **4**). Arguments: customerID

a CustomerIdentity object that represents the identity of the customer, activeOnly—if the returned metadata is only about the current interaction, pastOnly—if the returned metadata is only about past interactions, count—the number of interactions for which metadata is to be retrieved, start—the starting date of the interactions for which metadata is to be retrieved, end—the end date of the interactions for which metadata is to be retrieved. Return value: WebInteractionRequest object.

DoWorkOfGetRecentSessionsMetaDataAsync—Gets interaction metadata from the connection server, regarding a certain interaction. Arguments: req—WebInteractionRequest object. Return value: Array of WebInteractionMetaData objects.

DoWorkOfLoadCustomerSessionsDataAsync—Gets the interaction data from the connection server, regarding certain customer sessions. Arguments: sessionsMetaData—a collection of WebSessionMetaData objects. Return value: Array of WebInteractionData objects.

DoWorkOfLoadRecentCustomerSessionsDataAsync—Gets the interaction data from the server, regarding certain recent customer sessions. Arguments: req—WebInteractionRequest object. Return value: Array of WebInteractionData objects.

FindWebsite—Retrieves a website by searching the instances list for a website that matches the specified WebSessionMetaData. Arguments: metadata—the WebSessionMetaData of the desired website. Return value: Website object, or null if no match is found.

FireDataLoadedEvent—Sends the website DataLoaded event to execute the load event. Arguments: None. Return value: None.

FireDataLoadedEvent—Sends the website DataLoaded event. Arguments: status—a Boolean value indicating whether or not the PO Designer successfully loaded the data. Return value: None.

GetRecentSessionsMetaData—Retrieves metadata about recent sessions. Arguments: customerID—a CustomerIdentity object that represents the identity of the customer, activeOnly—if the returned metadata is only about the current sessions, pastOnly—if the returned metadata is only about past sessions, count—the number of sessions for which metadata is to be retrieved, start—the starting date of the sessions for which metadata is to be retrieved, end—the end date of the sessions for which metadata is to be retrieved. Return value: true if the recent sessions metadata retrieval is successful, false otherwise.

GetRecentSessionsMetaDataAsync—Retrieves metadata about recent sessions asynchronously. Arguments: customerID—a CustomerIdentity object that represents the identity of the customer, activeOnly—if the returned metadata is only about the current sessions, pastOnly—is the returned metadata is only about past sessions, count—the number of sessions for which metadata is to be retrieved, start—the starting date of the sessions for

which metadata is to be retrieved, end—the end date of the sessions for which metadata is to be retrieved. Return value: None.

GetRecentSessionsMetaDataAsyncCompleted—an asynchronous callback operation, for example, executed upon completion of a DoWorkOfGetRecentSessionsMetaDataAsyncmethod operation. GetRecentSessionsMetaDataAsyncCompleted may trigger the recent sessions metadata asynchronous results to be retrieved and the webpage to be loaded. Upon load completion, GetRecentSessionsMetaDataAsyncCompleted may send the MetaDataLoaded event. Arguments: asyncResult—The status of the asynchronous DoWorkOfGetRecentSessionsMetaDataAsync operation. Return value: None.

GetWebInteractionSessionArr—Gets interaction sessions of specified sessions metadata. Arguments: sessionsMetaData—a collection of WebSessionMetaData objects. Return value: Array of WebInteractionSession objects.

HandleNewPageType—Handle a new webpage type once discovered. Upon loading the website **2820** object with data, returned sorted from the connection server, the current page type may be compared to the type of the previous page. If the current page type is different from the previous page type, the new page type may be processed. Arguments: PageData object (pageData), Website object (ws), a list of WebPage objects (webPages), a list of WebPageMetaData objects (pagesMetaData), page IProperty holder (pageHolder). Return value: true if the new page type is handled successfully, false otherwise.

InitWebPlayer—Initializes the web player. Arguments: None. Return value: true if the web player is initialized successfully, false otherwise.

InnerLoadData—Loads the session data retrieved from the connection server into the website **2820** object. InnerLoadData may set the last session to be the current website session. Arguments: sessionsData—an array of WebInteractionData objects. Return value: true if the session data is loaded successfully, false otherwise.

InnerLoadData—Loads the session data retrieved from the connection server into the website **2820** object. InnerLoadData may set the last session to be the current website session. Arguments: wrapper—WebInteractionDataWrapper object that holds an array of WebInteractionData objects. Return value: true if the session data is loaded successfully, false otherwise.

InnerLoadMetaData—Loads the session metadata retrieved from the connection server into the website **2820** object. It sets the last session metadata to be the current website session metadata. Arguments: wrapper—WebInteractionDataWrapper object that holds an array of WebInteractionMetaData objects. Return value: None.

IsSafeToContinue—Validates whether it is possible to interact with the connection server, and whether a web recording feature is enabled. Arguments: methodName—The name of the method or operation scheduled to interact with the server. Return value: true if it is safe to continue executing the calling operation, false otherwise.

LoadCustomerSessionsDataFromMetaData—Loads data about sessions, e.g., defined by session metadata, into the website **2820** object. The data may be loaded into an internal collection. The last session metadata may be stored in the property CurrentSessionMetaData and its data may be loaded into the website **2820** object. Arguments: sessionsMetaData—a collection of WebSessionMetaData objects containing metadata about the session to be loaded into the website **2820** object. Return value: true on success, false otherwise.

LoadCompositeProperties—Loads all direct composite components properties into a direct component recursively. Arguments: page—IdirectComponentBase object to load the properties for, compositeData—an array of CompositeData objects, to load into the direct component, indx—an integer which indicates the position of the child composite data to process. Return value: None.

LoadCustomerSessionsDataFromMetaDataAsync—Asynchronously loads the data about sessions given by their metadata into the website **2820** object. The data may be loaded into an internal collection (e.g., not DirectDom). The last session metadata may be stored in the property CurrentSessionMetaData and its data may be loaded into the object. Arguments: sessionsMetaData—a collection of WebSessionMetaData objects containing metadata about the session to be loaded into the website **2820** objects. Return value: None.

LoadPageProperties—Loads all properties of the website **2820** object. Arguments: wp—WebPage object, pageData—PageData object, webPages—a list of webpage objects, pagesMetaData—a list of WebPageMetaData objects. Return value: None.

LoadPrimitiveProperties—Loads all direct primitive components properties into a direct component. Arguments: page—IdirectComponentBase object for which to load the properties, primitivePropsData—an array of PrimitiveData objects to load into the direct component. Return value: None.

LoadRecentCustomerSessionsData—loads data about sessions into the website **2820** object. The data may be loaded according to the arguments passed to the function's parameters. The CurrentSessionMetaData property may be updated with the last session metadata and its data may be loaded into the object. Arguments: customerID—a string that represents the ID of the customer, activeOnly—if the returned metadata is only about the current session, pastOnly—if the returned metadata is only about past sessions, count—the number of sessions for which metadata is to be retrieved, start—the starting date of the sessions for which metadata is to be retrieved, end—the end data of the sessions for which metadata is to be retrieved. Return value: true on success, false otherwise.

LoadRecentCustomerSessionsDataAsync—Asynchronously loads the data about sessions into the website **2820** object. The data may be loaded according to the arguments passed to the function's parameters. The CurrentSessionMetaData property may be updated with the last session metadata and its data may be loaded into the object. After the data is successfully loaded the event, DataLoaded may be sent. Arguments: customerID—a string that represents the ID of the customer, activeOnly—if the returned metadata is only about the current session, pastOnly—if the returned metadata is only about past sessions, count—the number of sessions for which metadata is to be retrieved, start—the starting date of the sessions for which metadata is to be retrieved, end—the end data of the sessions for which metadata is to be retrieved. Return value: None.

LoadSession—Loads a session data into the website **2820** object according to the metadata passed as an argument

to the function. The CurrentSessionMetaData property may be updated accordingly. Arguments: sessionMetaData—an object containing the metadata about the session to be loaded. Return value: true on success, false otherwise.

LoadWebPageMetaData—Loads WebPageMetaData to the website **2820** object. Arguments: pageProp—an IProperty page holder object, pageData—a PageData object. Return value: None.

LoadWebPageMetaData—Loads WebPageMetaData to the website **2820** object. Arguments: wp—a WebPage object, pageData—a PageData object. Return value: None.

LoadWebsiteWithData—Loads web session data into the website **2820** object. Arguments: ws—a Website object, webSessionData—a WebInteractionData object. Return value: true if the data is loaded to the website **2820** object successfully, false otherwise.

PlayCurrentSession—Plays the currently loaded web session in the web player. This function may use an API provided by systems and recording components to launch the web player. The function may also ensures that only one instance of the player is running Arguments: None. Return value: true if the WebPlayer is successfully launched, false otherwise.

PlaySession—Plays a recorded web session according to the metadata passed as an argument to this function. Arguments: sessionMetaData—a WebSessionMetaData object containing metadata about the recorded session to be played. Return value: true if the WebPlayer is successfully launched, false otherwise.

SetPageInstancesAndMetaData—Sets the web pages instances and sessions metadata. Arguments: webPages—a List of WebPage objects, pagesMetaData—a collection of WebPageMetaData objects. Return value: None.

StartPlayer—Starts the web player, which may play the web session of the specified recorded session ID. Arguments: ID—a LongIDWithSiteAndServer object. Return value: None.

StartPlayer—Asynchronously starts the web player, which may play the web session of the specified session metadata. Arguments: sessionMetaData—an object containing the metadata about the recorded session to be played. Return value: None.

TestWebPlayer—Plays a hardcoded web session for debug purposes. Arguments: None. Return value: None.

Website **2820** events may include, for example:

DataLoaded—an event that is executed when the data is successfully loaded into the website **2820** object. Event parameters may include the status of the data load status (e.g., succeeded or failed).

MetaDataLoaded—an event that is executed when the metadata is successfully loaded into the website **2820** object. Event parameters may include the status of the metadata load status (e.g., succeeded or failed).

Design Interfaces

Reference is made to FIGS. **29**A-**29**X, which schematically illustrate interfaces **2900**-**2962** for configuring web analytics solutions in accordance with an embodiment of the invention. Interfaces **2900**-**2962** may be provided, for example, via a PO designer (e.g., PO designer **1706** of FIG. **17**), which may be operated at agent device **120** or interaction center **124** of FIG. **1**. Operations for configuring web analytics solutions may include, for example (other or additional operations may also be used):

Capturing data extraction elements.

Defining a site structure, for example, using Business Entity parameters.

Creating a site, for example, using Business Entity instances.

Publishing a project.

In FIG. **29**A, interface **2900** may allow an agent or other user to create or select a web analytics solution **2970** (e.g., at the PO designer). The creation of web analytics solution **2970** may be divided into different tasks or projects (e.g., executed at the PO designer), for example, such as:

Configuration project (generating metadata for the web analyzer).

Data consumption project (generating real-time guidance rules).

These projects may have a shared task, for example, the definition of the website data model (e.g., pages, data extraction elements). This data model may serve both the configuration solution and the consumption solution. A 'Shared Business Entity (BE) Types' project may be created to contain this data model of the website. The web analytics solution may be divided into 3 separate projects:

'Shared Business Entity (BE) Types' project—definition of the website data model.

'Definition' Project—definition of screen elements and website instances captured (e.g., may have a project reference to the 'Shared BE Types').

'Consumption' Project—definition of website instances and the real-time guidance rules (e.g., may have a project reference to the 'Shared BE Types').

Web analytics solution **2970** may be created by selecting different solution properties, for example, including a solution version **2972**, a target orientation **2974** (e.g., classic or web), a target environment **2976**, a target automatic update folder **2978** and/or if multiple solutions share a single instance of a project **2980**. The target orientation **2974** may, for example:

Control the solution generation and distribution methods.

Define the functionality that is exposed to the operator of the PO designer.

Be operational or in-use when working on the 'Definition' project.

New solution orientation(s) may be added by the web analytics package. The solution orientation may be the target output of the solution, for example, one or more of the following:

PO Client

Thin Client

Web Analytics

Each solution orientation may have a different output during the generation process (.NET Assembly, javascript files or xml for web analytics).

In the example shown in FIG. **29**A, the target orientation **2974** may be "classic" for web analytics data consumption project or "web" for web configuration project, although other or target orientations may be used.

Capturing data extraction elements operations may be defined, for example, in the 'Definition' project. To initiate the capture operation, the PO Designer (e.g., operated by an operator selecting a capture button) may command a web analyzer (e.g., analysis server **116** of FIG. **1**) to capture elements designated for extraction. The capture operation may

distinguish between two types of extractions (e.g., which may be selected by the PO designer operator):

"Single instance" element extraction commands the web analyzer to extract a single appearance of an element in a webpage. For example: 'Full Name' in a user's address.

"Multiple instances" element extraction commands the web analyzer to extract multiple appearances of an element in a webpage. For example: 'Product Name' in a user's shopping cart.

When the PO designer operator designates a "multiple instances" element extraction for the web analyzer to extract all instances of the element (e.g., all products in an online shopping cart) the operator may modify 'Recognition Properties' of the element accordingly.

FIG. **29**B illustrates an interface **2902**, which the operator of the PO designer may use to command the web analyzer to initiate capturing web elements, for example, by selecting a capture button **2982**.

FIG. **29**B illustrates interfaces **2904** and **2906**, which the operator of the PO designer may use to mark a 'Show Hidden Captures' and 'Visible' menu options, for example, to view the captured screen elements. When an agent captures a screen element using a PO designer, in some embodiment, only the captured screen element node is shown without the parents tree (e.g., the page node). The Show Hidden Captures menu option allows the entire tree to be shown. The visible menu option allows only nodes in the elements tree that are marked visible to be shown, e.g., for selection in the business objects tree.

FIG. **29**C illustrates interface **2908**, which shows a screen elements tree including all elements in the path of the screen element's to be extracted. The web analyzer may retrieve web (e.g., IE) nodes from the screen elements tree. The web nodes include web documents and web elements. In some cases, there may be more than one document in the element's path.

FIG. **29**D illustrates interface **2912**, which the operator of the PO designer may use to verify that 'recognition properties' of the web document are properly configured, for example, to identify all instances of the document. The PO designer may verify this, for example, using wild card values (* or %) for the recognition properties. Recognition properties used to identify a document may include, for example:

URL—the URL of the document.

Title—the title of the document. The title may identify the contents of the document and may be display in the header bar of the document window.

IDs of Contained Elements—the ID of the elements contained in the document (if available).

By default the PO Designer may mark the minimum set of properties used for unique recognition (e.g., the URL property may be sufficient). The URL may include customer specific data, which the PO Designer may eliminate using the wild card recognition properties. In the example shown in FIG. **29**D, the is modified to use the * wildcard: http://www.amazon.com/gp/cart/view.html/*

FIG. **29**E illustrates interface **2914**, which the operator of the PO designer may use to verify that 'recognition properties' of the web element are properly configured, for example, to identify all instances of the element. Recognition properties used to identify an element may include, for example:

ID—the ID of the element.

Name—the name of the element.

Tag Name—the tag name of the element.

XPATH—the HTML path to the element.

Source Index—the ordinal position of the object, in source order, as the object appears in the document's collection.

Inner Text—the text between the start and end tags of the object.

Visibility—an indication whether the content of the object is displayed.

By default the PO Designer may mark the minimum set of properties used for unique recognition. However, the values captured by the PO designer may be insufficient in some cases and the PO designer may verify that the recognition satisfies all cases. The priority of the 'recognition properties' may be for example:

ID

Name

XPATH

FIG. **29**F illustrates interface **2916**, which the operator of the PO designer may use to define the structure of the site, for example, using Business Entity types. Interface **2916** may define the website structure, for example, by defining one or more of the following properties (other or additional properties may also be defined):

Add new library types, for example, including web site and web page types.

Create a new web site type.

Create a new web page type for each captured web page.

(This information may be defined, for example, in the 'Shared BE Types' project using Business Entity types.) In the example in FIG. **29**F, the PO designer may have two predefined Business Entity types installed, for example: Web Page **2984** and Web Site **2986**.

Each page (e.g., IE Document) that is captured may be represented by a Business Entity type. To create a new page type for each captured page, the operator of the PO designer may execute the following steps using interfaces **2918**-**2922** of FIGS. **29**F-**29**H.

To initiate the process, the operator may create a new type using a 'New Type' button and may set the name of the new type.

In interface **2918** of FIG. **29**F, the operator of the PO designer may change the base type to a page library type (e.g., using a library objects folder).

In interface **2920** of FIG. **29**G, the operator of the PO designer may create one or more new properties or change the properties to primitive types, such as, text, number, date, etc. (e.g., using a library objects folder). The PO designer may repeat this step to define all the primitive properties of the captured page. If the page contains complex data structures (e.g., product data structure in a shopping cart webpage), the PO designer may repeat configurations in interfaces **2920**-**2922**.

In interface **2922** of FIG. **29**H, if the property is a list, the operator of the PO designer may choose a property type contained in the list. For example, a shopping cart webpage type may be assigned a 'List of Products' property type.

FIG. **29**I illustrates an example interface **2924** showing a file directory structure for recording data using a 'Product' Business Entity type and two Page Business Entity types (Address Page and Shipping Cart Page) for each captured page, which may be defined, for example, follows:

Product: contains the following properties:

Name (Text)

Quantity (Number)

Price (Text)

Gift (Boolean)

Address Page: contains the following properties:

Address 1 (Text)

Address 2 (Text)

Full Name (Text)

City (Text)

State (Text)
ZIP (Number)
Shipping Cart Page: contains the following properties:
Customer Name (Text)
SubTotal (Text)

To create a new website type, the operator of the PO designer may execute the following steps using interfaces **2926**-**2928** of FIGS. **29**J-**29**K.

To initiate the process, the operator may create a new type using a 'New Type' button and may set the name of the new type.

In interface **2926** of FIG. **29**J, the operator of the PO designer may change the base type to a site library type (e.g., using a library objects folder).

In interface **2928** of FIG. **29**K, the operator of the PO designer may add a property types for each page defined (e.g., by dragging and dropping the property types into the new site type).

To create a site Business Entity instance and to link its properties to the screen elements, the operator of the PO designer may execute the following steps using interfaces **2930**-**2946** of FIGS. **29**L-**29**S. (This information may be defined, for example, in the 'Definition' project.)

To initiate the process, the operator may create a new instance using a 'New Instance' button and may set the name of the new instance. Alternatively, the new instance may be created by selecting the Site Business Entity type and the 'Create an instance of . . . '.

In interface **2930** of FIG. **29**L, the operator of the PO designer may change the type to a site business entity type.

In interface **2932** of FIG. **29**M, the operator of the PO designer may select properties to be ignored (e.g., which are only relevant in the consumption project), such as, start date and end date in the site and page Business Entity types.

In interfaces **2934** and **2936** of FIGS. **29**N and **29**O, the operator of the PO designer may select the screen element data source representing each primitive property of the pages. The operator may select an 'Automatically assign from' data field in interface **2934** and select a screen element property to be extracted by the web in interface **2936**.

In interfaces **2938**-**2942** of FIGS. **29**P-**29**R, the operator of the PO designer may map the corresponding screen element data source to the relevant property within the list's contained object for each list property of the pages. The operator may select an 'Initial Value' data field in interface **2938**, select a "Map List" function of the library object type in interface **2940**, and map each property of the Business Entity type to the relevant screen element (e.g., by opening a new dialog box) in interface **2942**.

FIG. **29**S illustrates an example interface **2944** showing a file directory structure where the site instance includes, for example, a 'Customer Identity' complex property with attributes: ID and Type. If the web analyzer cannot obtain the customer ID from a cookie, the operator of the PO designer may repeat operations using interface **2932** to link the Customer Identity ID property and the corresponding screen capture. If the ID is mapped, then The Customer Identity Type property may also be initialized using the 'Initial Value' data field.

FIG. **29**S illustrates an example interface **2946** showing a file directory structure where the site instance includes, for example, a 'Domain' property that may be initialized, for example, an the 'Initial Value' data field. A sample value may be, for example: www.google.com.

FIG. **29**T illustrates an example interface **2948** for publishing the project to the web analyzer, where the web analyzer receives the web configuration created by the PO Designer. Once the web configuration is created, a user may select to generate the project in solution properties **2990** (e.g., using a 'Publish' button), which may initiate the project validations and creation. The publish operation may create an XML file, which may be uploaded to the database using a rule manger (e.g., rule manager **426** of FIG. **4**). The web analyzer may read the web configuration from the database.

FIG. **29**U illustrates an example of an interface **2952** of a website and screen elements **2988** monitored and/or extracted. Interface **2952** and screen elements **2988** may be defined by the web analytics configurations defined in interfaces **2900**-**2950** of FIGS. **29**A-**29**S.

The PO designer definitions for real-time guidance may include, for example, one or more of the following rules (other or additional rules may also be executed):

Create a new project and add project reference to the 'Shared BE Types' project.
Create a website Business Entity instance.
Create logic to handle one or more of the following:
Web sessions data consumption (e.g., metadata and/or web site data).
Rules for web session data identification, filtering or extraction.
Launching the web player.

(This information may be defined, for example, in the 'Consumption' project.)

In interface **2954** of FIG. **29**V, the operator of the PO designer may set parameters defining which user web sessions are to be monitored by the web analysis system. Interface **2954** may include fields defining a user's information (e.g., the value of their customer ID) and/or session information (e.g., all sessions, sessions at specific dates or ranges of dates, and/or including any ongoing sessions) to monitor only specified user sessions. Interface **2954** may include a dedicated function editor added by a web analytics package. In different embodiments, web interactions in the specified user sessions may be extracted in their entirety or with metadata only.

FIG. **29**W illustrates examples of rule interfaces **2956** and **2958** for evaluating extracted web session information. Rule interface **2956** may define an instruction for web analyzer to evaluate screen elements, for example, associated with products in a shopping cart. Rule interface **2958** may define an instruction for web analyzer to evaluate a session categorization of extracted screen elements. Other or additional rules may be used.

FIG. **29**X illustrates an example of interfaces **2960** and **2962** to launch a web player (e.g., web player **1710** of FIG. **17**). Interface **2960** may launch the web player with current user sessions for shadow-browsing and interface **2962** may launch the web player with sessions metadata.

It may be appreciated that "real-time" may refer to instantly or, more often, at a small time delay of, for example, between 0.01 and 10 seconds, during, concurrently, or substantially at the same time as. In one example, playing the user's current Internet interactions in a real-time simulation may include playing the user's interaction (or an edited version thereof) on the agent's display (e.g., output device **125** of FIG. **1**), for example, at the same time as, at a time delay from, or during the same communication (e.g., telephone and/or web) session as, the user executes the interaction. In another example, sending the agent device recommendations in real-time may include, sending the agent device recommendations, e.g., via agent monitor, while an agent is communicating or conversing with the user e.g., via telephone (or other

media communications, such as on-line text chat). The recommendations may be provided in text or as automatically generated speech.

It may be appreciated that although certain devices and functionality are assigned to "users," "customers," "agents," and "operators" these are only example scenarios and such functionality may be implemented by any users. The users may include two or more live users, two or more automated user(s) or a combination of live user(s) and automated user(s).

Different embodiments are disclosed herein. Features of certain embodiments may be combined with features of other embodiments; thus certain embodiments may be combinations of features of multiple embodiments.

Embodiments of the invention may include an article such as a computer or processor readable non-transitory storage medium, such as for example a memory, a disk drive, or a USB flash memory encoding, including or storing instructions, e.g., computer-executable instructions, which when executed by a processor or controller, cause the processor or controller to carry out methods disclosed herein.

The foregoing description of the embodiments of the invention has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. It should be appreciated by persons skilled in the art that many modifications, variations, substitutions, changes, and equivalents are possible in light of the above teaching. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the invention.

What is claimed is:

1. A method for monitoring a user's interactions with Internet-based programs or documents, the method comprising:

extracting content from Internet server traffic according to predefined rules;

associating the extracted content with one or more of a user's Internet interaction sessions;

storing and indexing the user's Internet interaction sessions;

automatically comparing, by a web analyzer using a processor, one or more of the user's Internet interaction sessions to one or more modeled sessions to generate a recommendation of one or more future session paths from the modeled sessions for guiding the user's Internet interactions; and

providing the recommendation of the future session paths from the modeled sessions on screen to a contact center agent while the contact center agent is communicating with said user during a telephone call initiated by the user between the agent and the user.

2. The method of claim **1** comprising identifying the user by text captured on a screen element of a webpage used in the one or more of the user's Internet interaction sessions.

3. The method of claim **1**, wherein the predefined rules define content to be extracted according to parameters selected from the group consisting of: a title of webpage(s), date/time webpage(s) created, product(s) viewed, prices offered, product categories (used vs. new, wholesale vs. retail, etc.), customer search words, customer highlighting or selection of products, a type of web object, the presence or frequency of certain key-words, how long ago a webpage was viewed, the amount of time a webpage is viewed, a number of times or which different items are selected on a webpage, and the order in which the webpage was viewed.

4. The method of claim **1** comprising generating a summary of the user's past or current Internet interaction sessions and providing said summary to the contact center agent while the contact center agent is communicating with said user for guiding the user's Internet interaction.

5. The method of claim **4**, wherein the summary comprises data selected from the group consisting of: a description of the user's interaction sessions, product viewed, and prices offered.

6. The method of claim **1** comprising, using a web player, providing the agent with a playback of the user's past or current Internet interaction sessions during the telephone call between the agent and the user.

7. The method of claim **1** comprising capturing the Internet server traffic using a passive sniffing device.

8. The method of claim **1**, wherein the Internet server traffic is captured over one media channel and the agent and user communicate over another media channel.

9. The method of claim **1**, wherein the information analyzed in the user's Internet interaction sessions includes keywords the user used for searching.

10. The method of claim **1**, wherein the recommendation includes information for technical support, selling, "up-selling," "cross-selling," or filling in surveys.

11. The method of claim **1**, wherein the recommendation is provided to the contact center agent in real-time.

12. A system for monitoring a user's interactions with Internet-based programs or documents, the system comprising:

a processor to extract content from Internet server traffic according to predefined rules, associate the extracted content with one or more of a user's Internet interaction sessions, index the user's Internet interaction sessions, automatically compare one or more of the user's Internet interaction sessions to one or more modeled sessions by executing a web analyzer to generate a recommendation of one or more future session paths from the modeled sessions for guiding the user's Internet interactions and to provide the recommendation of the future session paths from the modeled sessions on screen to a contact center agent while the contact center agent is communicating with said user during a telephone call initiated by the user between the agent and the user; and

a storage device to store the one or more of the user's Internet interaction sessions.

13. The system of claim **12** comprising a passive sniffing device to capture the Internet server traffic.

14. The system of claim **12** comprising a first media channel over which the Internet server traffic is captured and a second different media channel over which the agent and user communicate.

15. The system of claim **12** comprising a computer and telephone operated by the user, wherein an Internet connection at the user's computer is monitored for Internet server traffic and the telephone call between the contact center agent and the user telephone triggers the processor to send the contact center agent the recommendation.

16. The system of claim **12** comprising a text capturing module, wherein the text capturing module identifies the user by capturing text on a screen element of a webpage used in the one or more of the user's Internet interaction sessions.

17. The system of claim **12**, wherein the processor generates a summary of the user's past or current Internet interaction sessions provided to the contact center agent while the contact center agent is communicating with said user for guiding the user's Internet interaction.

18. The system of claim **12** comprising a workstation operated by the contact center agent, the workstation having a display and a web player, wherein the display uses the web

player displays a playback of the user's past or current Internet interaction sessions during the telephone call between the agent and the user.

19. The system of claim **12** comprising a semi-automated and semi-live contact center agent.

20. The method of claim **1**, wherein the one or more modeled sessions are real-life sessions generated by interactions of one or more other users.

21. The method of claim **1**, wherein the one or more modeled sessions are generated in a computer-training environment by a trainer.

22. The method of claim **1**, wherein the one or more modeled sessions are retrieved from a pool of sessions that most closely matches features used in the user's current Internet interaction session.

23. The method of claim **1**, wherein the one or more modeled sessions include a fixed linear path of webpages to browse.

24. The method of claim **1**, wherein the one or more modeled sessions include a dynamic tree-structure of paths, where each chosen webpage path leads to a different predicted modeled future session path.

25. The method of claim **1**, wherein the information analyzed in the user's Internet interaction sessions includes product details viewed.

26. The method of claim **1** comprising automatically and passively determining the user identity of the extracted content, by the web analyzer using the processor, by passively sniffing the Internet server traffic.

27. The method of claim **1** comprising displaying to the agent, during the telephone call between the agent and the user, a key-value summary of the extracted content associated with one or more of the user's Internet interaction sessions.

28. The method of claim **1** comprising receiving the predefined rules from a user which determines the web elements to be extracted on a web page.

29. A method for monitoring a user's interactions with Internet-based programs or documents, the method comprising:

extracting a webpage screen element, by a web analyzer using a processor, from Internet server traffic according to predefined rules;

associating the extracted webpage screen element with one of a plurality of a user's Internet interaction sessions;

storing and indexing the plurality of the user's Internet interaction sessions;

automatically analyzing, by the web analyzer using the processor, the plurality of the user's Internet interaction sessions to generate a recommendation for guiding the user's Internet interactions; and

providing the recommendation, which is generated based on said automatically analyzing the user's plurality of Internet interaction sessions, on screen to a contact center agent while the contact center agent is communicating with said user during a telephone call initiated by the user between the agent and the user.

* * * * *

CERTIFICATE OF SERVICE

I hereby certify that, on this 12th day of January, 2017, I filed the foregoing Brief for Plaintiffs-Appellants with the Clerk of the United States Court of Appeals for the Federal Circuit via the CM/ECF system, which will send notice of such filing to all registered CM/ECF users.

/s/ *Gregory H. Lantier*
GREGORY H. LANTIER
WILMER CUTLER PICKERING
HALE AND DORR LLP
1875 Pennsylvania Avenue, NW
Washington, DC 20006
(202) 663-6000

CERTIFICATE OF COMPLIANCE

Pursuant to Fed. R. App. P. 32(a)(7)(C), the undersigned hereby certifies that this brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B) and Circuit Rule 32(b).

1. Exclusive of the exempted portions of the brief, as provided in Fed. R. App. P. 32(a)(7)(B), the brief contains 12,922 words.

2. The brief has been prepared in proportionally spaced typeface using Microsoft Word 2010 in 14 point Times New Roman font. As permitted by Fed. R. App. P. 32(a)(7)(C), the undersigned has relied upon the word count feature of this word processing system in preparing this certificate.

/s/ *Gregory H. Lantier*

GREGORY H. LANTIER
WILMER CUTLER PICKERING
HALE AND DORR LLP
1875 Pennsylvania Avenue, NW
Washington, DC 20006
(202) 663-6000

January 12, 2017